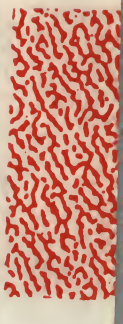
user manual



DM 280
dot matrix printer

Olivetti Peripheral Equipment Spa
Via Torino, 603
10090 S. Bernardo d'Ivrea
Torino, Italy

Telephone (0125) 525
Telex 210030
Telefax (0125) 230823

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This equipment conforms to ECC Directive 82/499 regarding the prevention and elimination of radio frequency disturbances (D.M. 10 April 1984).

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna.

Relocate the computer with respect to the receiver.

Move the computer away from the receiver.

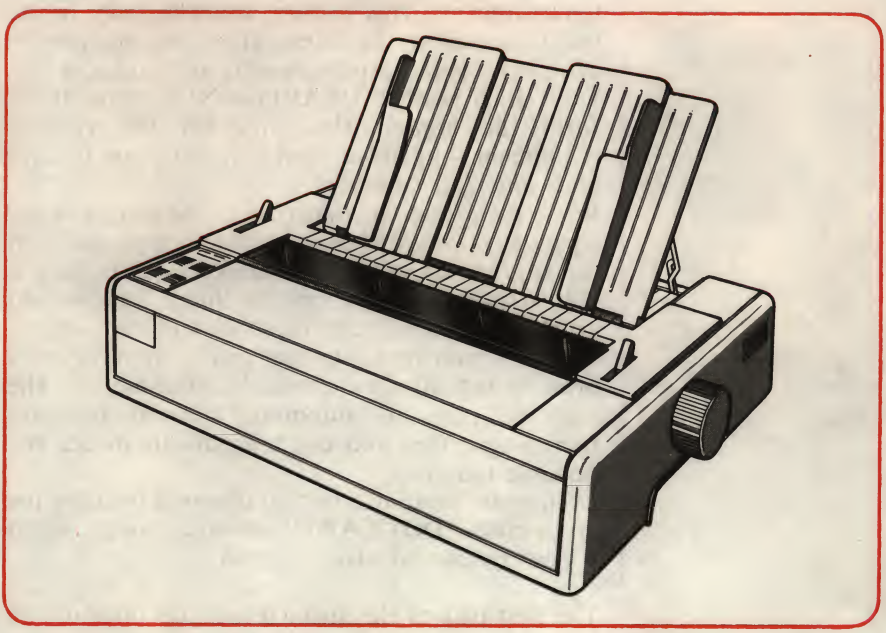
Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.

The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4.

To insure compliance to F.C.C. requirements, connection of this peripheral requires the use of grounded shielded cables.



This manual introduces you to the dot matrix printer and helps you to obtain the best operating performance according to your own personal requirements. The printer operates at an impact printing speed of 160 char/s and offers various combinations of printing styles (normal, near letter quality (NLQ), enlarged, emphasized, condensed or various combiantions of these), all of which can be underlined.

It works bidirectionally when set to alphanumeric printing and monodirectionally when set to graphic printing or when programmed to do so.
When the printer is set to NLQ mode (by dip switch, or via the control system), the quality of both alphanumeric and graphic printing is greatly improved. Because the printing matrix is magnified four times (from 9 × 9 to 18 × 18), it gives a much sharper character definition, very similar to typewritten characters. This feature, available only in the latest generation of printers, allows the operator to achieve a superior printing quality and to choose between either normal (DRAFT) or NLQ mode. It ensures the highest flexibility for the varying requirements of office work, allowing you to save both time and money.
When the printer is connected to the computer via a parallel interface of the "Standard" type, and with the appropriate set of command codes, the user is able to operate with extreme flexibility. Layouts and graphic illustration are much easier and printing quality is improved. The user can easily carry out a printing test after switching the machine on. The machine runs an automatic self-test program (autodiagnostics) and can immediately detect any possible failure.
Even better printing quality is obtained by using the proprietary "DOT CART" ribbon cartridge, which is both quick and easy to install.

The first part of this manual contains information concerning the components of the printer and how to set it up and use it.

The second part describes the printer command codes and their functions.

The appendices contain the printer's specifications, technical data on the interface, the table of character codes available, some examples of possible printing combinations, a troubleshooting guide for faults which may occur during printer set-up and a concise summary of the command codes.
To get the best results from the printer, we recommend you to read this manual carefully.

Unpacking Procedure

The printing unit container consists of two polystyrene shells. It is packed in a carton with two open sides wrapped in a heat resistent plastic cover.

Remove the plastic cover, cutting along the separation line of the two shells.

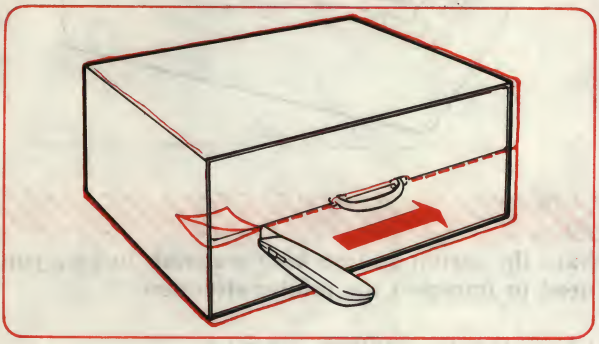


Fig. 1.1
Packaging

Place the carton on a flat surface and remove the polystyrene container.

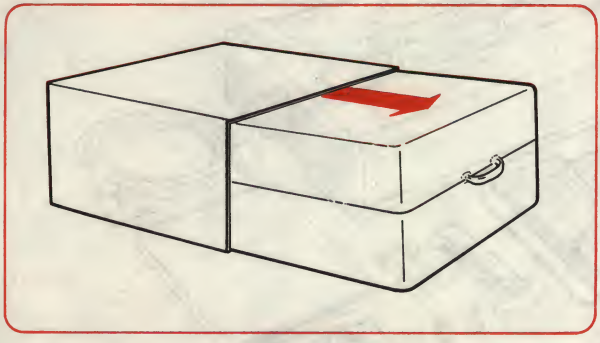
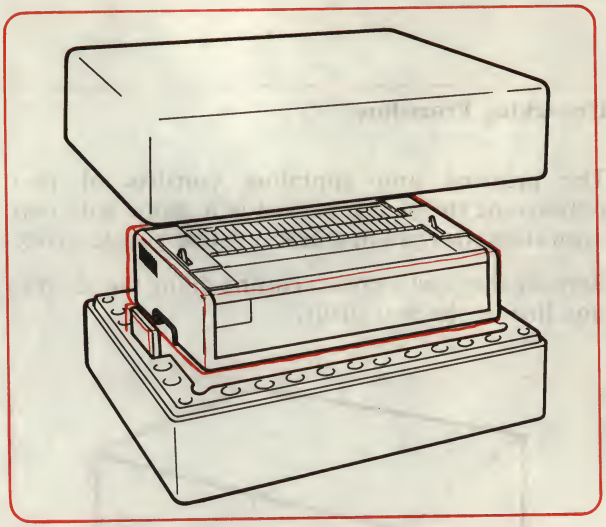


Fig. 1.2
Removal of the container

Then remove the upper shell.

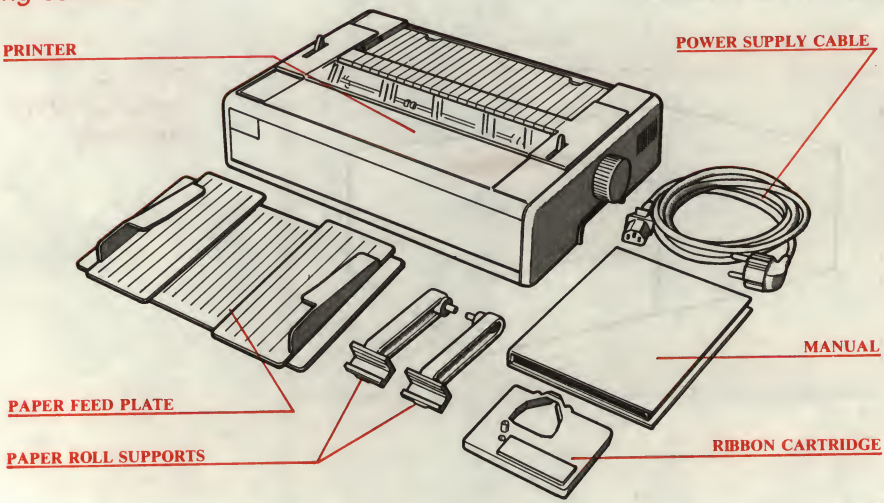
Fig. 1.3
Opening the Container



Save the carton and packing materials in case you need to transport the printer elsewhere.

Check that the contents consist of:

Fig. 1.4
Packing contents



The paper roll supports (option) will be included in the carton only if they have been ordered together with the printer; otherwise they will be packed separately. If the optional sprocket or automatic sheet feed has been included in the order, it will be packed separately.

Make sure all the items are present; if something missing or damaged, contact your dealer or the Technical Assistance Service.

To prevent permanent damage to the various components, the information in this manual should be read carefully, BEFORE CONNECTING THE PRINTER TO THE MAINS POWER SUPPLY.

After removing the printer from its container, take it out of the plastic bag.

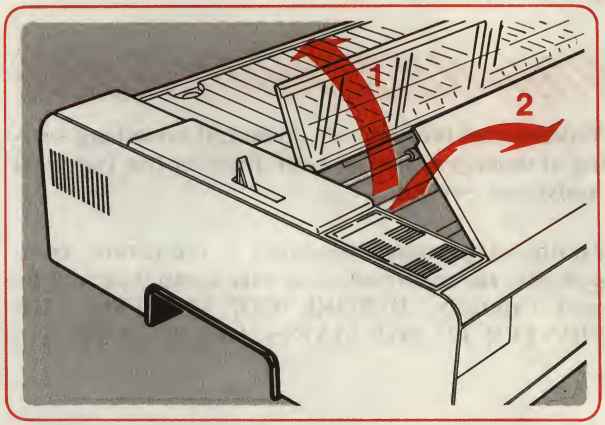
Remove the protective film from the window on the transparent cover and from the operating console.

Fig. 1.5
Removal of
Protective Film

To release the print head:

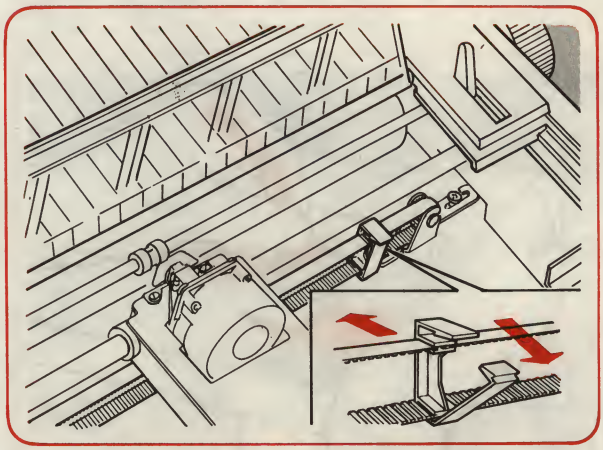
- open the transparent and top covers by pulling them upwards

Fig. 1.6 Opening Front Cover



- open and remove the plastic block which holds the head carriage secure during transport.

Fig. 1.7 Releasing the Print Head

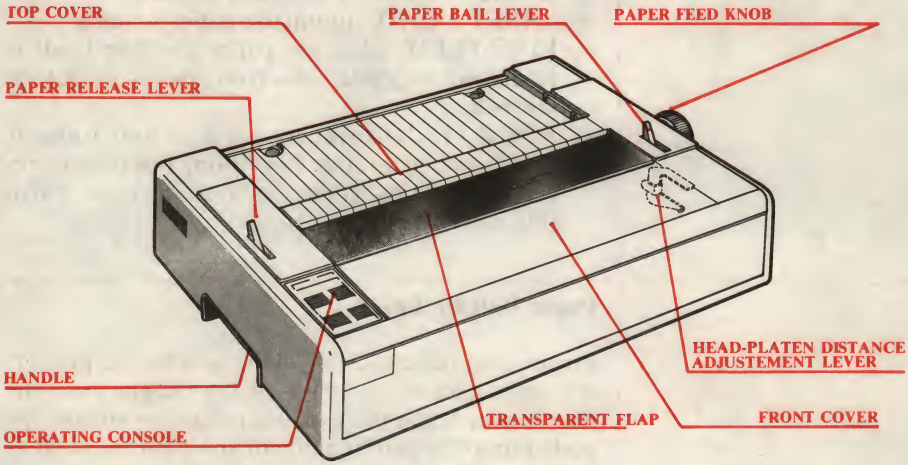


The Printer

Place the printer on a flat surface with the front panel and the console on the left, turned towards the operator, so that all the controls shown in the figure below are within easy reach.

- Top cover
- Front cover
- Operating console
- Paper release lever
- Paper bail lever
- Paper feed knob
- Handles
- Head-platen distance adjustement lever
- Transparent flap

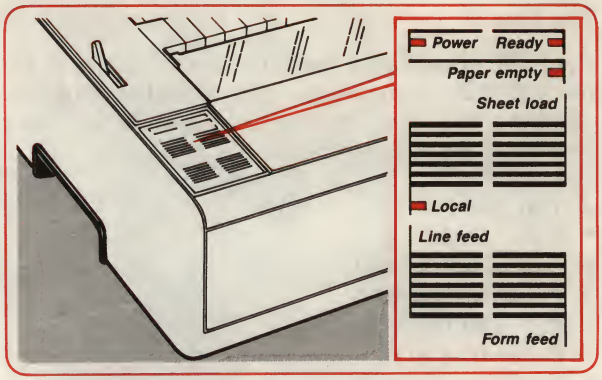
Fig. 2.1
Printer Controls (Front)



Operating Console

The console consists of four membrane switches and four LED indicator lights and is situated at the front of the printer at the left.

Fig. 2.2
Operating console



- ☐ POWER: printer switched on
- ☐ READY: printer ready to receive data
- ☐ PAPER EMPTY: indicates paper shortage
- ☐ LOCAL: local mode (off line)
- ≡ LOCAL: selects or deselects printer
- ≡ SHEET LOAD: automatic paper loading
- ≡ LINE FEED: advances paper one line feed; if held down at printer switch on, executes machine self-test
- ≡ FORM FEED: advances paper to next form; if held down at printer switch-on, prints data received via interface in hexadecimal form (HEX-DUMP)

Paper Release Lever

Located on the upper left hand side of the printer, this lever releases and engages the platen. Push the lever towards the back of the printer to engage the platen to allow printing on cut sheet forms, such as A4 sheets, or any friction feed sheet.

Push the lever towards the front of the printer to release the platen for printing on continuous stationery (carried by the optional tractor feeder).

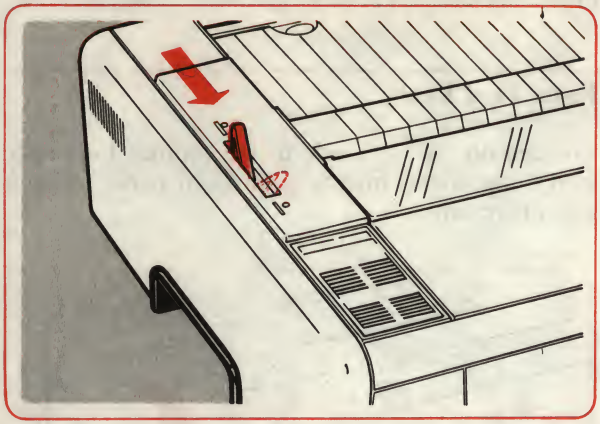


Fig. 2.3
Paper release lever

Paper Bail Lever

Located on the upper right hand side of the printer, the paper bail lever allows correct positioning of the paper pressed against the rubber platen and ensures the best possible print quality.

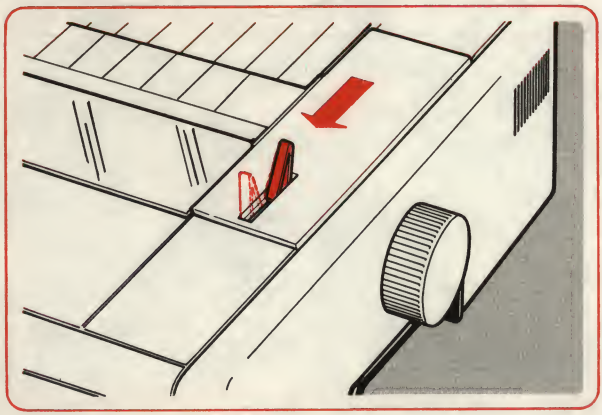


Fig. 2.4
Paper bail lever

If set towards the front of the printer it frees the rubber platen and facilitates paper feed. If set towards the back of the printer, the paper bail keeps the sheet pressed against the platen for smooth paper feeding.

Paper Feed Knob

Located on the right side of the printer, the paper feed knob allows manual control of paper loading and movement.

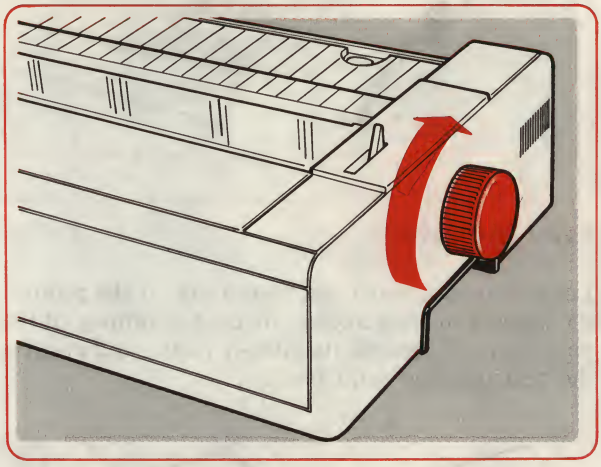


Fig. 2.5
Paper feed knob

Head-Platen Distance Adjustment Lever

Located under the front cover on the right hand side of the printer, this lever has three functions; it simplifies paper and ribbon cartridge insertion, and raises the print head to allow the use of multipart forms and different paper thicknesses. To access the lever, lift the transparent flap and top cover.

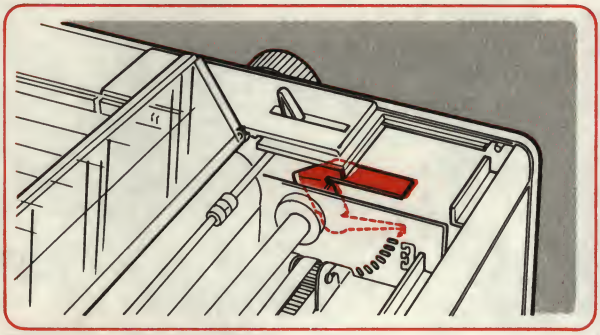


Fig. 2.6 Head-Platen Distance Lever

This lever has seven positions corresponding to seven different settings for the head-platen distance.

Each position is indicated by a notch on the printer casing. Notch 1 sets the lever in its top position and gives the minimum distance between print head and platen. Notch 7, with the lever in its lowest position, gives the maximum aperture.

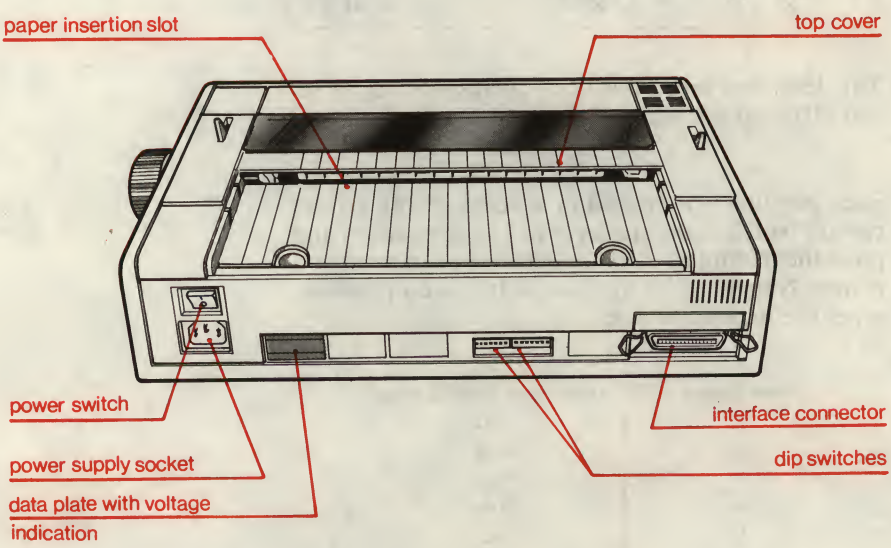
Notch Number	Head-Platen Distance (mm)
1	0.32
2	0.36
3	0.4
4	0.44
5	0.48
6	0.52
7	0.56

For a sheet of paper 0.1 mm thick, the head-platen distance must be 0.4 mm, corresponding to Notch 3 (see paper characteristics given in the Appendix). For ticker paper, set the lever accordingly.

Turn the printer round to find the rear switchboard where the following controls are located (see picture).

Top cover
Paper insertion slot
Power switch
Power supply socket
Data plate with voltage indication
Dip switches
Interface connector

Fig. 2.7
Layout of controls



Ribbon Insertion

3/1

Before switching on the printer, read the following paragraphs carefully.

The printer uses an inked ribbon cartridge which is quickly and easily installed; use an original Olivetti "DOT CART" ribbon cartridge for perfect print quality and long life. The ribbon cartridge should be inserted with the printer switched **OFF.**

To insert the ribbon cartridge, open the transparent flap and top cover.

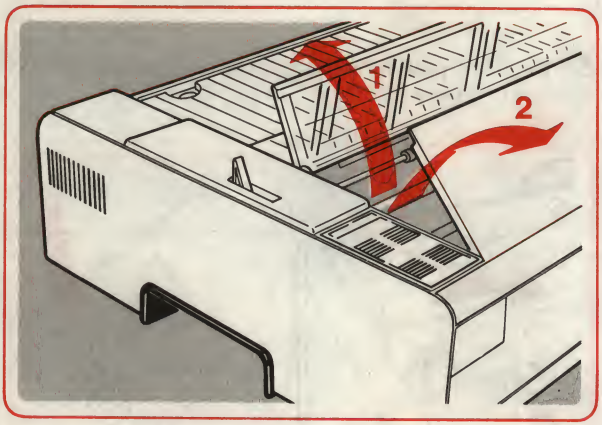
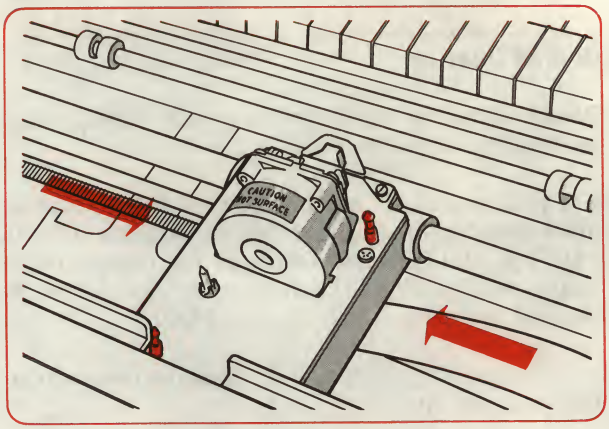


Fig. 3.1
Opening
Front Cover

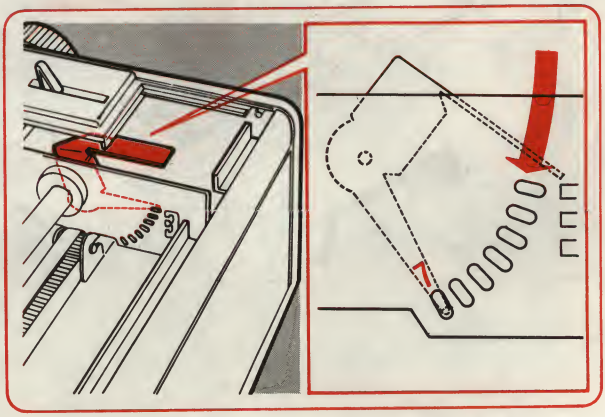
Move the print head carriage to the centre of the printer, and make sure that the upper paper pressure rollers are not in the cartridge insertion area.
The ribbon cartridge is positioned onto the print head carriage and it is fitted in place by means of two locking pins.

Fig. 3.2
Positioning the print head



Set the head-platen distance lever to position 7 (maximum aperture).

Fig. 3.3
Adjusting the head-platen distance lever



Move the paper bail lever towards the back of the printer to place the paper pressure rollers against the rubber platen.

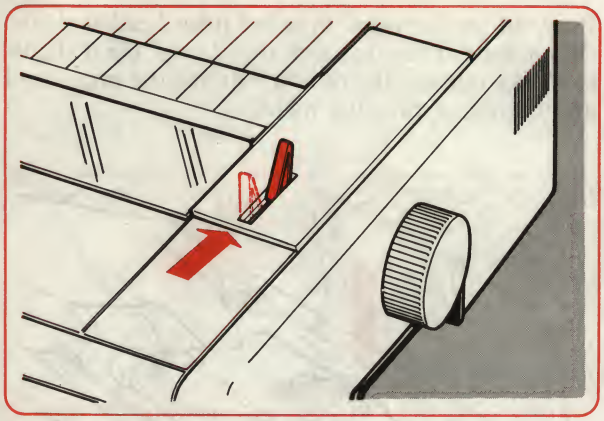


Fig. 3.4
Positioning the paper bail lever

If the ribbon cartridge is to be replaced, first remove the used cartridge, grasping it on either side and drawing it upwards.

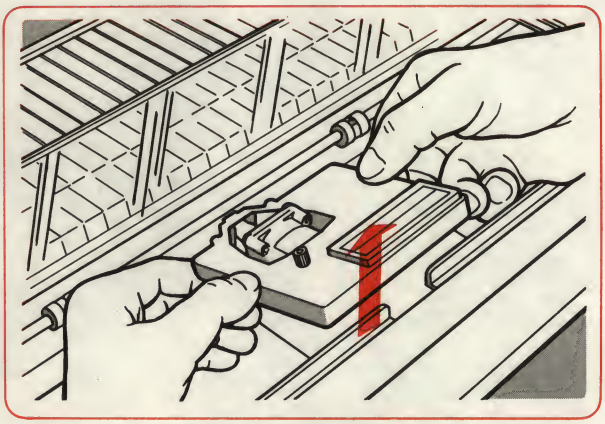
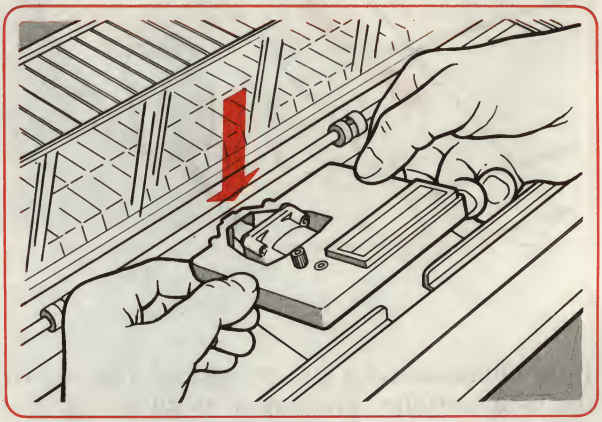


Fig. 3.5
Inserting the cartridge

If a cartridge is being inserted in a new printer for the first time, the cartridge loading mechanism is empty.

Position the cartridge over the print head with the ribbon output face towards the platen. Tip it slightly so as to thread the ribbon between the print head and the paper pressure plate.

Fig. 3.6
Inserting Cartridge



Press the cartridge down gently on to the two mounting pins. If there is excessive resistance, reposition it and try again.

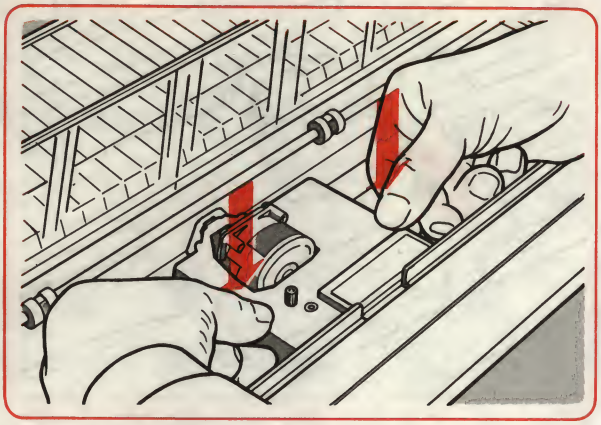


Fig. 3.7
Positioning Cartridge

If necessary turn the ribbon adjustment knob on the cartridge anticlockwise to adjust the ribbon tension.

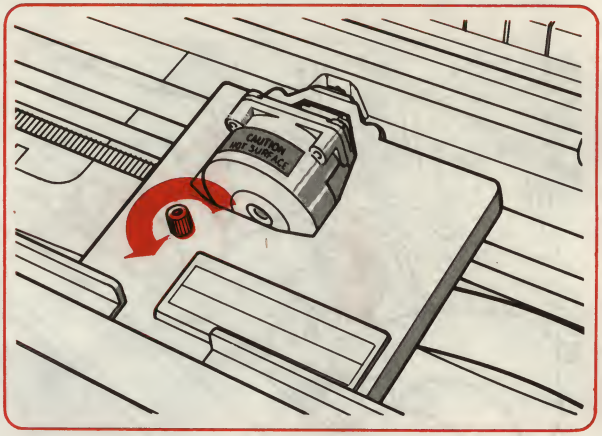


Fig. 3.8
Adjusting Ribbon Tension

Check that the cartridge is fixed firmly in place.

Return the head-platen distance lever to the position giving the best printing quality for a given paper thickness.
Position 3 is optimum for single-sheet printing.

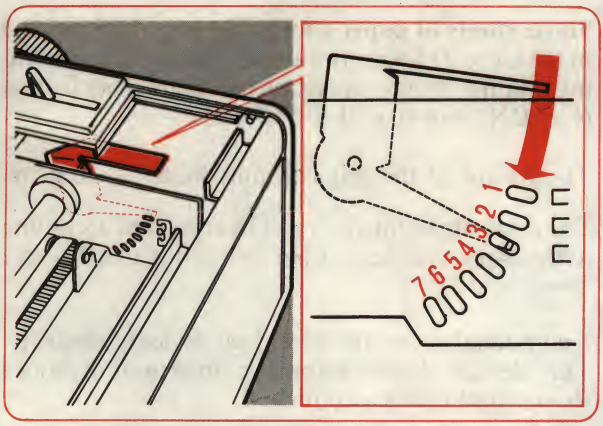


Fig. 3.9
Adjusting the head-platen distance lever

Close the transparent flap and top cover.

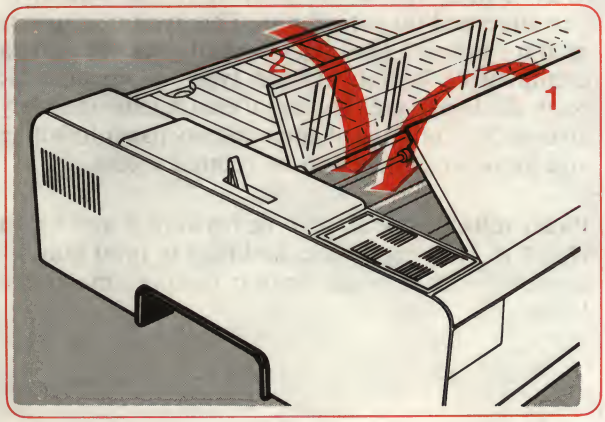


Fig. 3.10
Closing the front cover

Paper Loading

Printing is possible on any type of paper: single sheets, continuous stationery, or paper rolls.

Single sheets of paper may be between 7.25 and 8.5 in (184.1 to 215.9 mm) wide, and are used for printing original documents requiring single sheet format (e.g. UNI A 4 size 21 x 29.7 cm).

The weight of the original must be 60 – 70 g/m^2.

The print stroke intensity can be regulated according to the paper thickness, using the head-platen distance lever.

An optional automatic sheet feed device is available. This device allows automatic insertion of single sheets, on interface command.

Continuous stationery between 3.5 and 8.5 in (88.9 to 215.9 mm) wide can be used with the optional tractor device, and forms between 9 and 9.5 in. (228.6 to 241.3 mm) wide can be used on the standard drive pins mounted on the printer. This type of paper is used for printing long sequences of data requiring a minimum of layout: various types of documents, originals, labels, etc. The use of continuous stationery gives correct printing alignment, easy paper handling and automatic collection of printed sheets.

Paper rolls (optional) may be between 6 and 8.5 in. (152.4 to 215.9 mm) wide, and used to print long sequences of data which do not require any special layouts.

Open the transparent flap and grasping the top cover by its middle section, pull it slightly upwards.

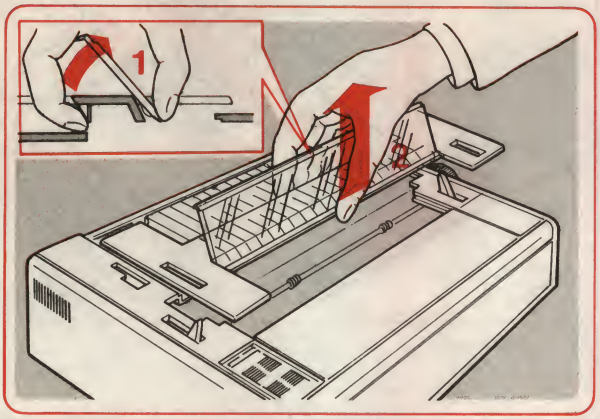


Fig. 3.11
Removing the top cover

Release the drive pins by setting the levers towards the front of the printer, slide them outwards and lock them in place by means of the levers.

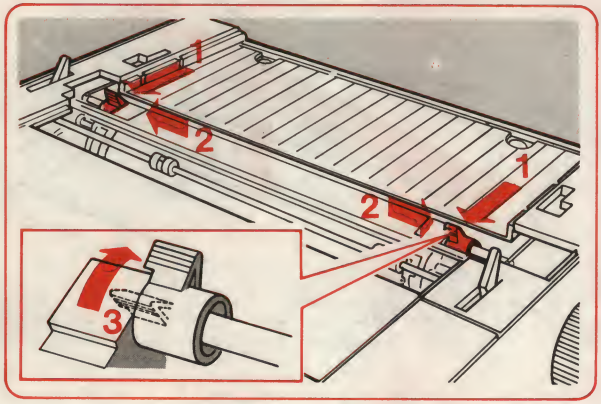
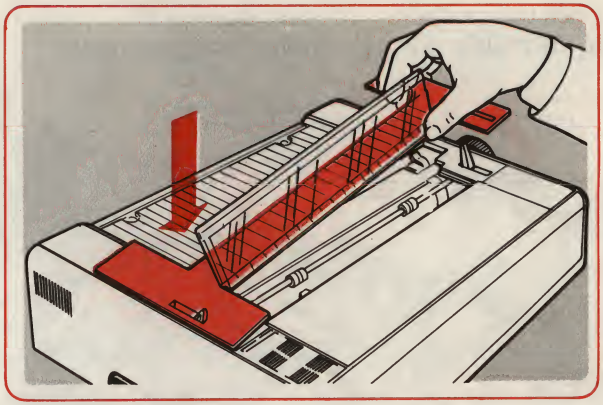


Fig. 3.12
Positioning the drive pins

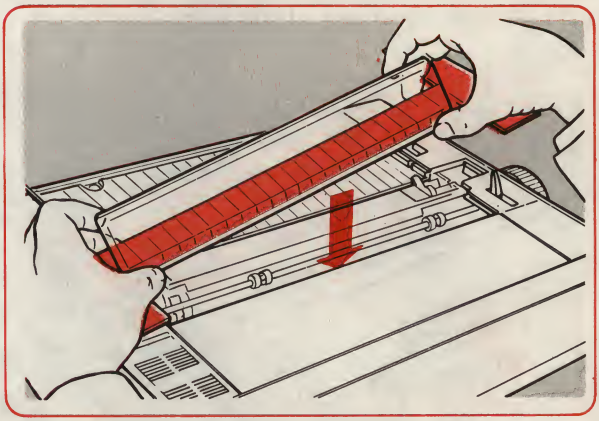
Replace the top cover by inserting the left side into position.

Fig. 3.13
Replacing the top cover



Reposition the right side by gently pushing it downwards.

Fig. 3.14
Closing the top cover



Make sure that the cover is fixed properly to the printer casing; close the transparent flap of the platen.

Position the paper feed vertically on the printer casing and insert the pins in the front pair of mounting holes on the rear cover of the printer.

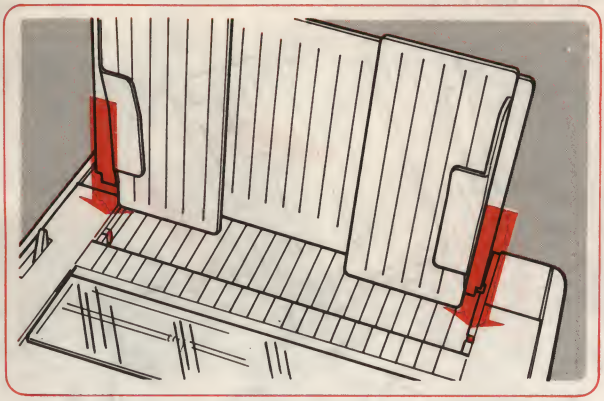


Fig. 3.15
Inserting the paper feed unit

Check the correct insertion of the paper feed unit by rotating it slightly backwards and forward.

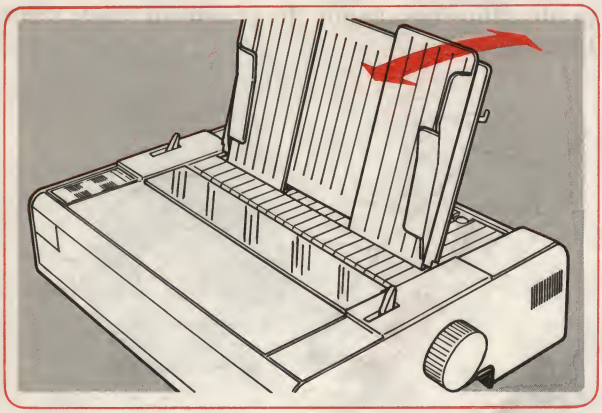
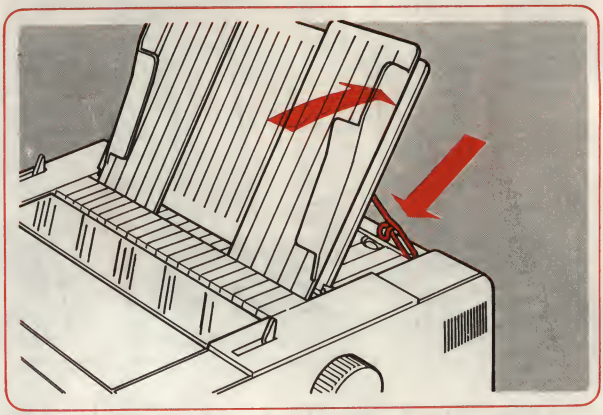


Fig. 3.16
Checking the setting of the paper feed unit

The movement must be smooth with no resistance.

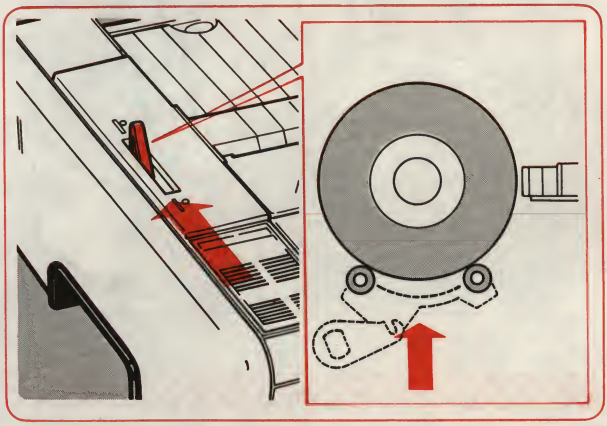
Lean the paper feed unit towards the back of the printer far enough to insert the far-most-end of the support bar in the guide groove on the upper part of the housing.

Fig. 3.17
Positioning the paper feed unit



Push the paper release lever towards the rear of the printer, thus positioning the platen for single sheet feeding.

Fig. 3.18
Positioning the paper release lever



Push the paper bail lever towards the front of the printer, releasing the upper paper pressure rollers.

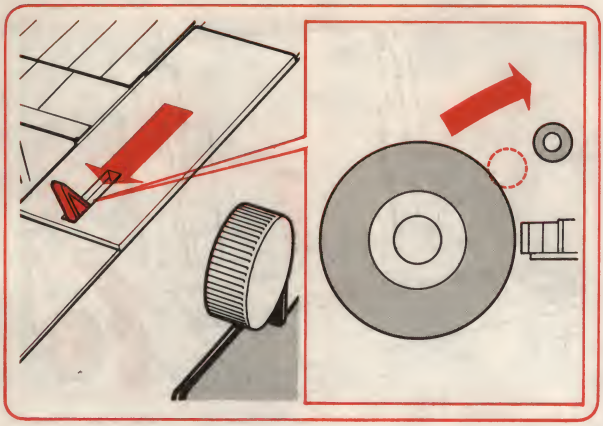


Fig. 3.19
Positioning the paper bail lever

Manual Insertion of Single Paper Sheet

Insert the paper sheet inside the slit sliding it within the paper guides. Adjust the paper guide distance according to the paper width.

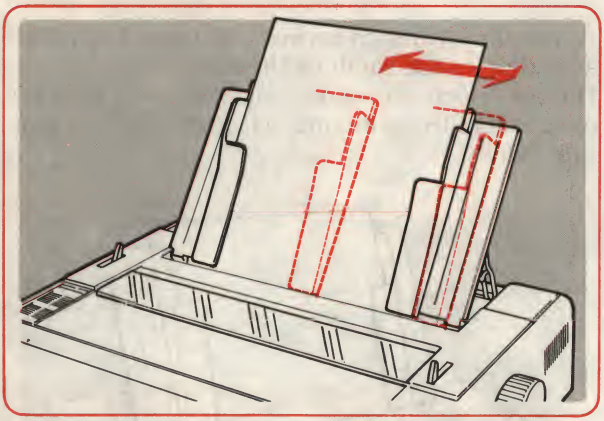
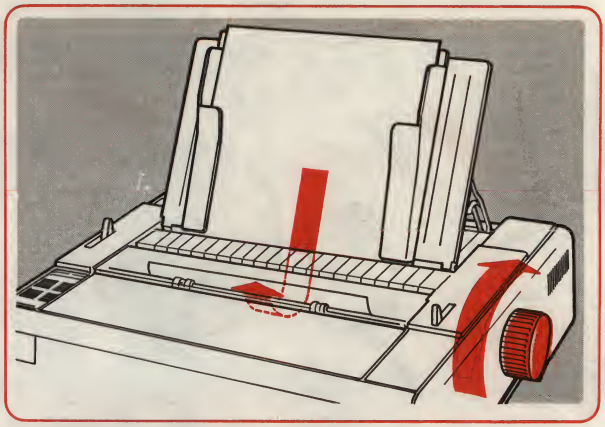


Fig. 3.20
Adjusting the guide

The sheet of paper should be aligned with the rubber platen left edge, to give a reference point for the text to be printed.

Turn the paper feed knob and position the paper sheet on the desired print line.

Fig. 3.21
Manual paper sheet insertion

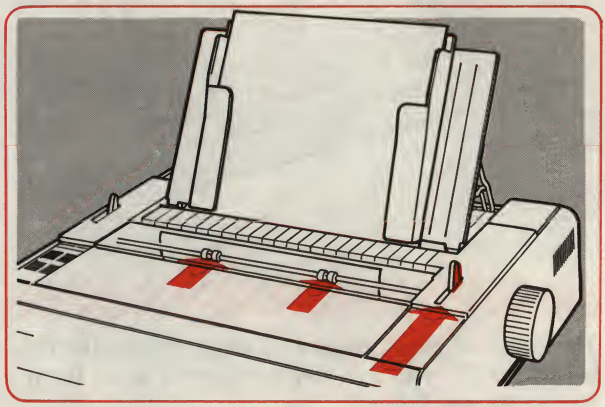


The paper feed knob controls the platen directly, thus allowing paper setting at any point on the sheet.

Push the paper bail lever towards the rear of the printer to keep the paper against the platen.

Adjust the separation between the paper bail rollers according to the width of the form.
Do not underestimate the separation between the paper bail rollers as this may adversely affect the printing quality.

Fig. 3.22
Holding the paper in place



Automatic Single Sheet Loading

The loading of a single sheet can also be performed automatically. This operation is accomplished by pressing the "Sheet-Load" key on the console. This key is only operational when the printer is powered on and in LOCAL condition. Carefully follow the procedures outlined in the following chapters before powering it on.
Refer to the preceding paragraph to set the printer to automatic single sheet loading.

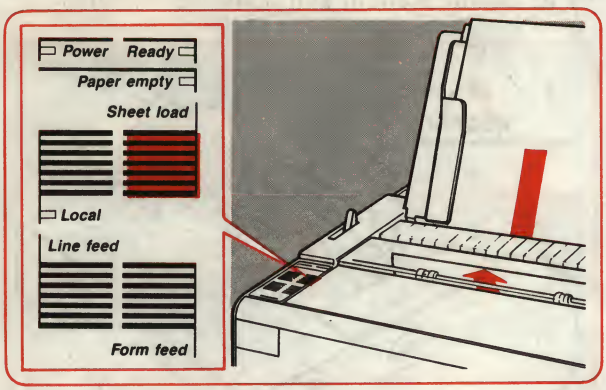


Fig. 3.23
Automatic sheet insertion

Continuous Paper Feed without Tractor Device

This printer allows the use of continuous fan-fold forms without the tractor device, as the rubber platen is equipped with two lateral drive pins. The distance between the pins can be adjusted from 9 to 9.5 in. (228.6 to 241.3 mm) and allows the use of different types of forms.

For correct use, proceed as follows:

Open the transparent flap and grasping the top cover by its middle section, pull it slightly upwards.

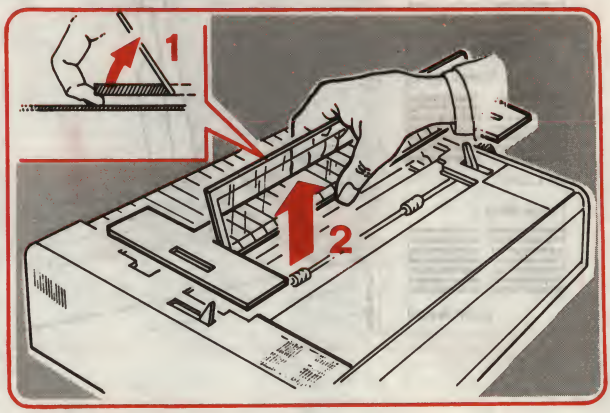


Fig. 3.24 Removing the top cover

Release the pins by setting the levers towards the front of the printer.

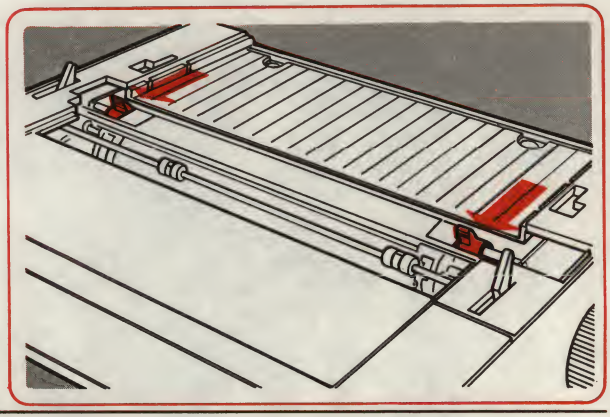


Fig. 3.25 Releasing the drive pins

Set the paper release lever towards the front of the printer so that the paper is fed only by the pins.

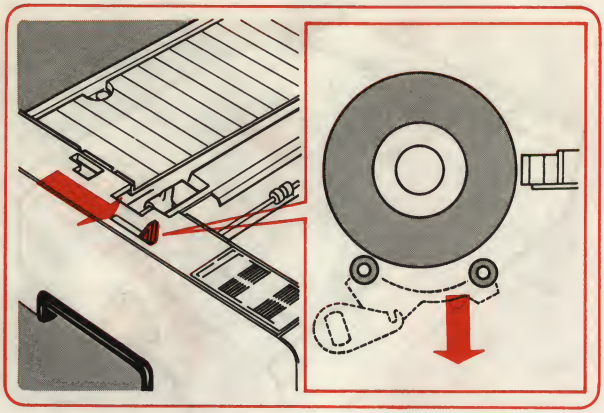


Fig. 3.26
Positioning the paper release lever

Set the paper bail lever towards the front of the printer, releasing the platen sufficiently for paper insertion.

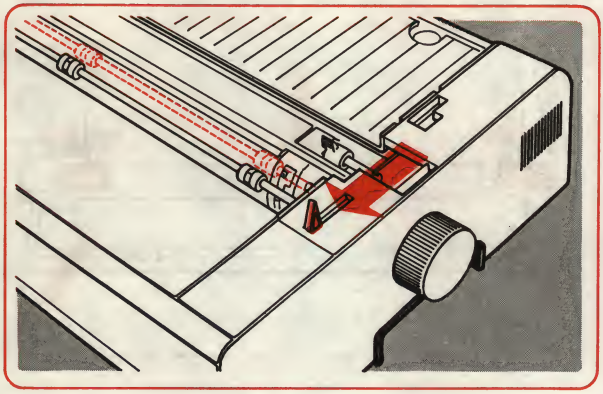
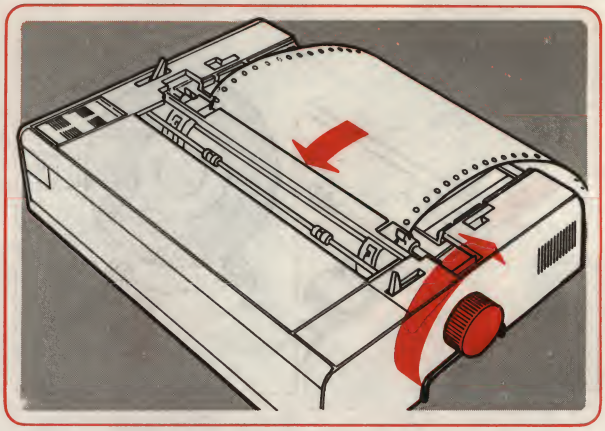


Fig. 3.27
Positioning the paper bail lever

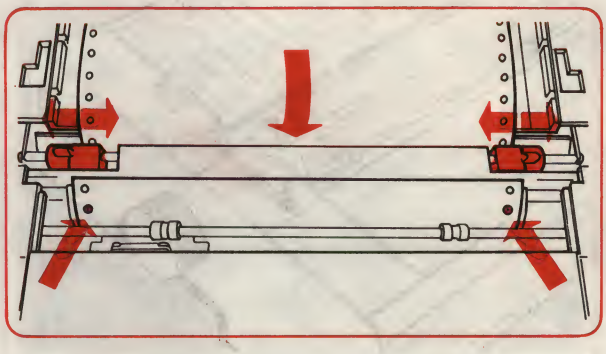
Insert the continuous form inside the slit and push it against the rubber platen.

Fig. 3.28
Inserting the continuous form



Adjust the drive pins according to the width of the form and lock them in place by means of the levers. Feed the form by rotating the manual paper feed knob.

Fig. 3.29
Positioning the continuous form



Turn the paper knob until the paper appears above the platen, then push the paper bail lever towards the back of the printer so as to correctly position the form on the rubber platen.

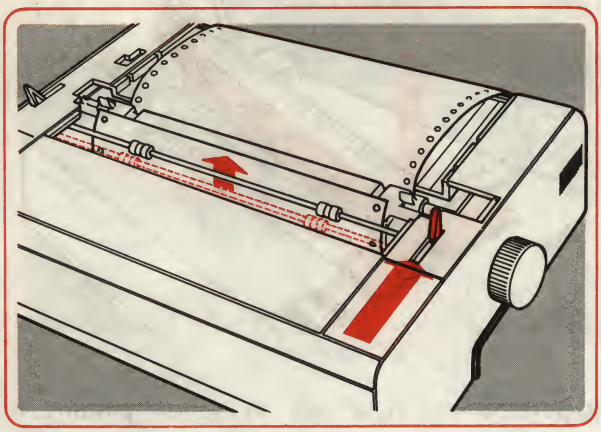


Fig. 3.30 Holding the continuous paper form

If necessary, adjust the drive pins to tighten the paper and then lock them in place by means of the levers.

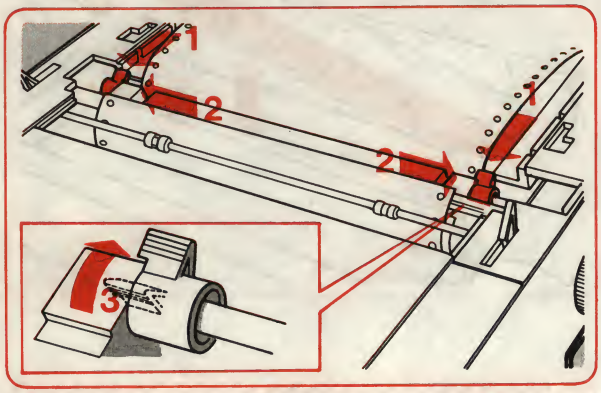
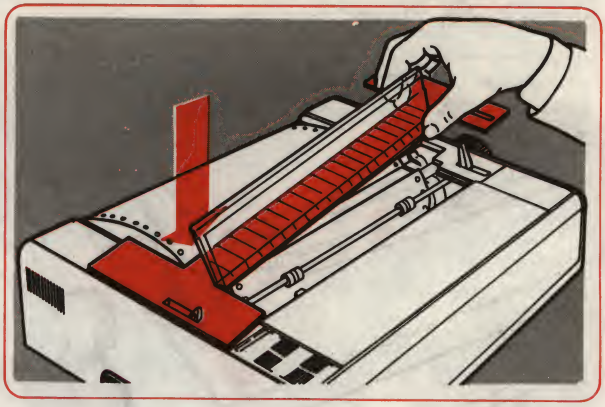


Fig. 3.31 Locking the drive pins

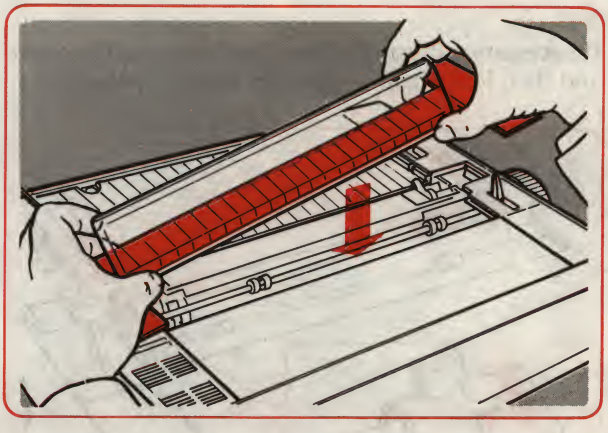
Replace the top cover by inserting the left side into position.

Fig. 3.32 Replacing the top cover



Reposition the right side by gently pushing it downwards.

Fig. 3.33 Closing the top cover



Make sure that the cover is fixed properly to the printer casing; close the transparent flap of the platen.

Remove the paper guides from the paper feed, grasping their lower edges and pulling them upwards.

Fig. 3.34
Removing the paper guides

Fix the paper feed unit in the rear pair of grooves on the rear printer casing so that it is sloping. Make sure nothing is blocking the paper feed path.

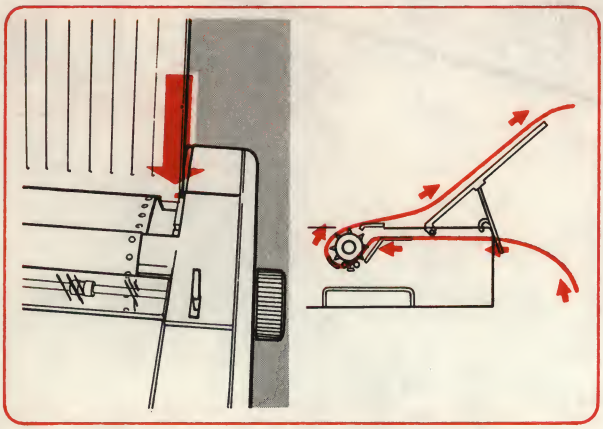
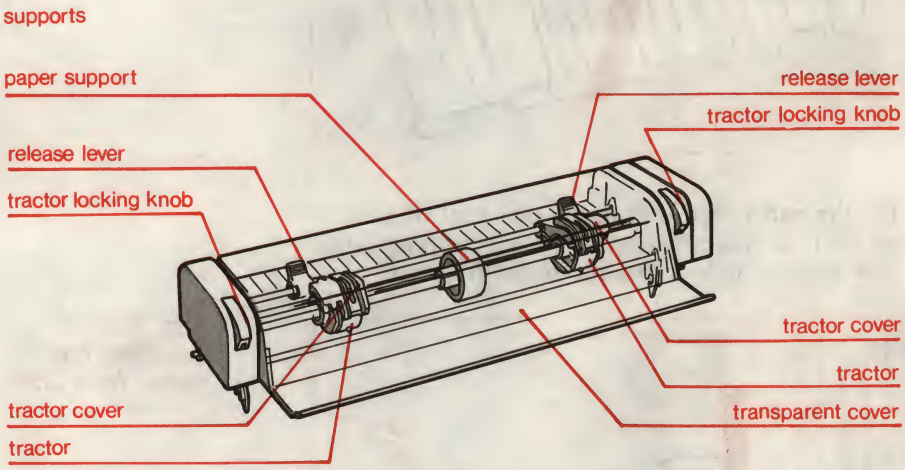


Fig. 3.35
Inserting the paper feed unit

To simplify handling of continuous stationery, an optional tractor device can be installed on the printer.

Fig. 3.36
Tractor device



To mount the tractor device on the printer, proceed as follows:

Remove the top cover (pressure-mounted on the printer casing) to access the internal paper feed area and the tractor device mounting hooks.
To this purpose open the transparent flap and grasping the top cover by its middle section, pull it slightly upwards.

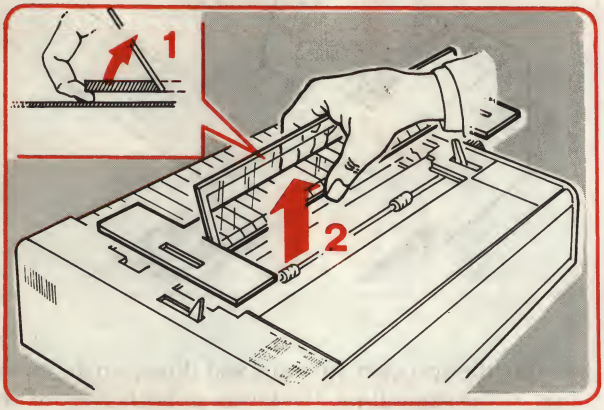


Fig. 3.37
Removing the top cover

Release the drive pins by setting the levers towards the front of the printer, slide them outwards and lock them in place by means of the levers.

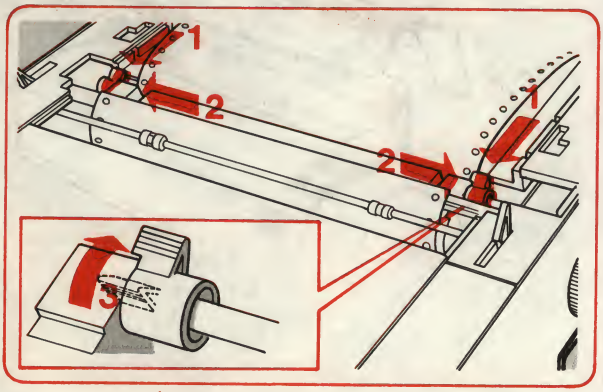
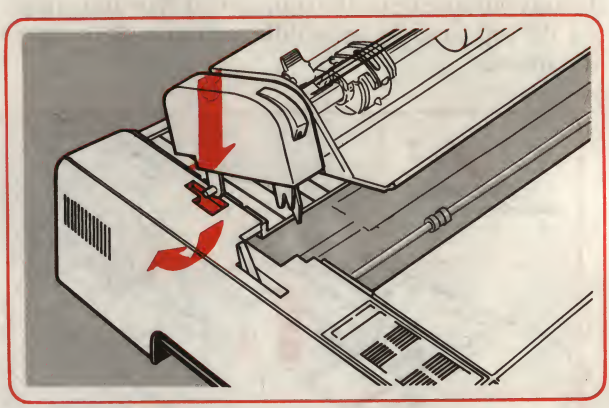


Fig. 3.38
Positioning the drive pins

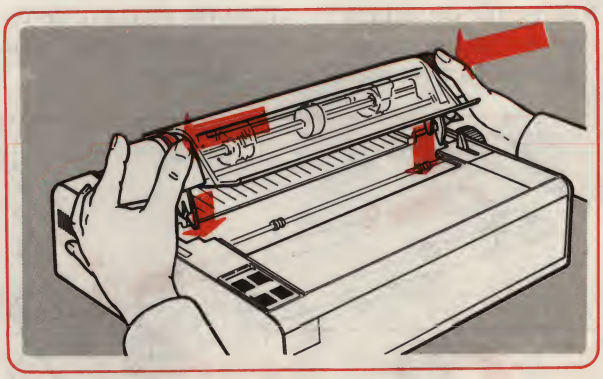
Position the sprocket so that its hooks are pointing downwards over the mounting slots, accessible now that the top cover has been removed. Push it downwards, inserting the hooks in the slots, sliding them in the guides.

Fig. 3.39
Inserting the tractor device



Rotate the sprocket forward and downwards, pressing, at the same time, the levers at both sides of the front of the sprocket. Hook the sprocket on to the hubs at both ends of the upper side of the platen.

Fig. 3.40
Locking the tractor device



Make sure the tractor device is fixed properly, by turning the paper feed knob. If the tractor device is positioned correctly, the pins will rotate smoothly; if not, repeat the entire tractor device installation operation carefully.

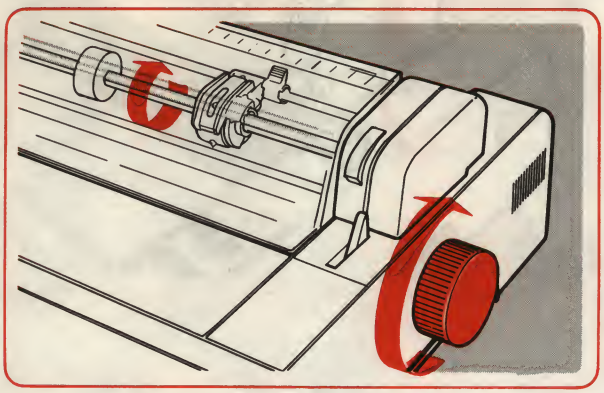


Fig. 3.41 Checking the movement of the tractor device

Removing the Tractor Device

To remove the tractor device, proceed as follows:

Press the front side levers at either end of the tractor device, to release the front hooks from around the hubs on the platen, and tip it backwards and upwards, rotating it on its rear hooks.

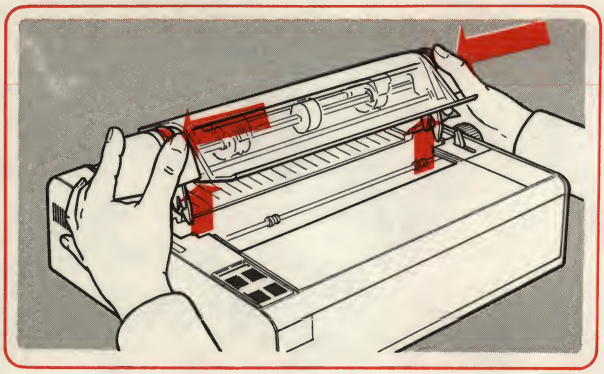
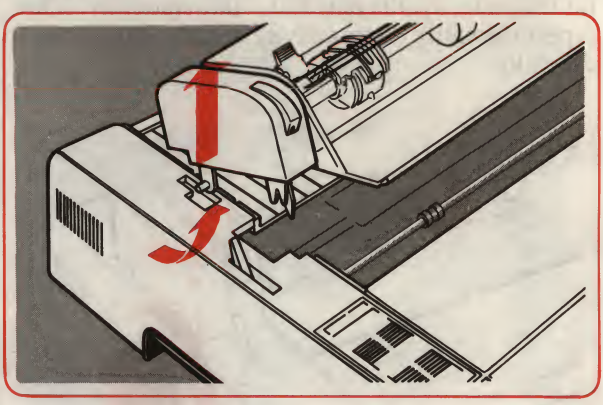


Fig. 3.42 Releasing the tractor device

Take the tractor device off by pulling it upwards and sliding the rear hooks out of their slots.

Fig. 3.43 Removing the tractor device



Replace the top cover following the procedure outlined in Fig. 3.31 and 3.32.

Continuous Paper Form Loading Using the Tractor Device.

The continuous form must be loaded after the tractor device has been installed and in the absence of the paper feed unit.
Push the paper bail lever towards the front of the printer to separate the paper bail and platen. Position the paper bail rollers at the two ends of the supporting bar.

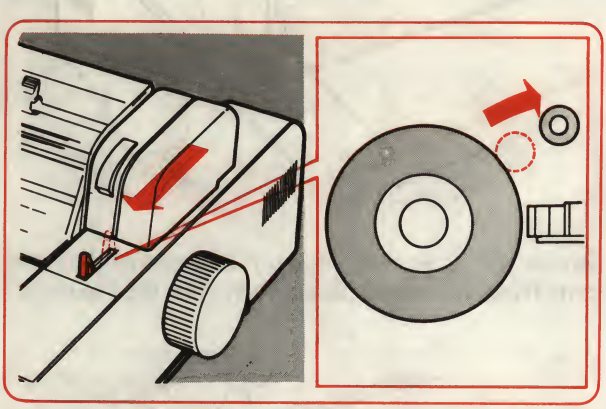


Fig. 3.44
Positioning the paper bail lever

Push the paper release lever towards the back of the printer to allow the end of the continuous form to be fed by rotating the paper feed knob.

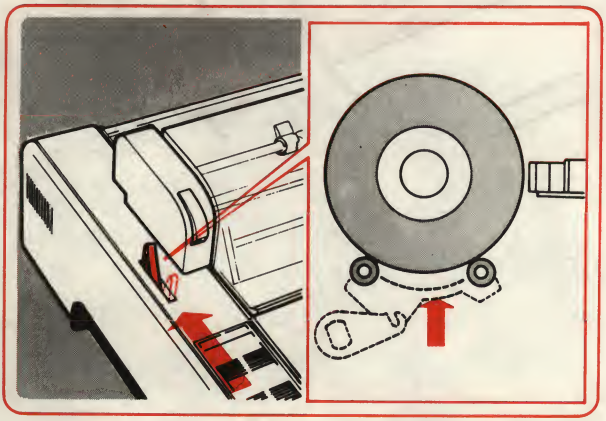
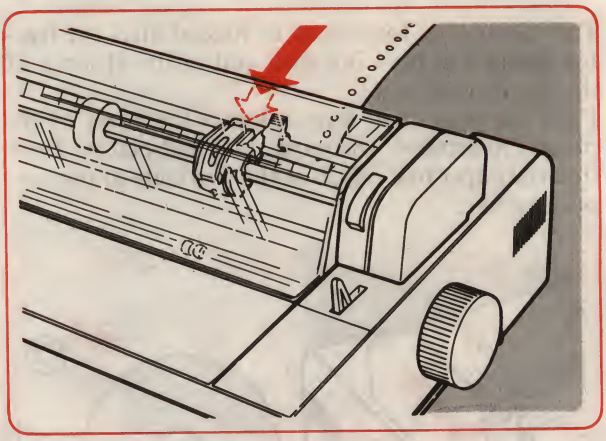


Fig. 3.45
Positioning the paper release lever

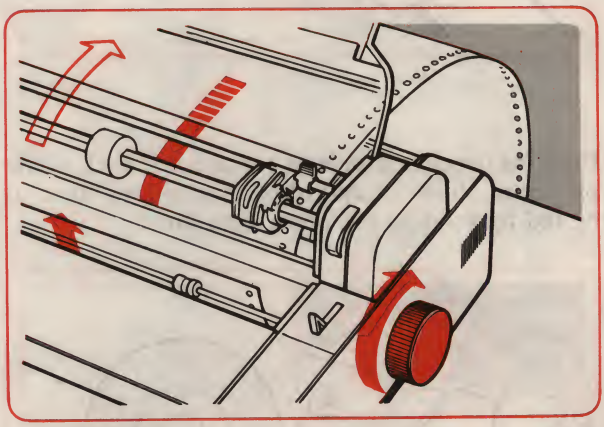
Insert the end of the form in the space behind the tractor towards the paper slit of the printer.

Fig. 3.46 Inserting the continuous form



Rotate the paper feed knob until the end of the form exits from the rubber platen, then open the top cover.

Fig. 3.47 Advancing the continuous form



Release the paper by pulling the paper bail lever towards the front of the printer. The paper is now fed by the tractor pins only.
Release the two tractor driving pins by means of their levers and adjust their positions and that of the centre paper support.

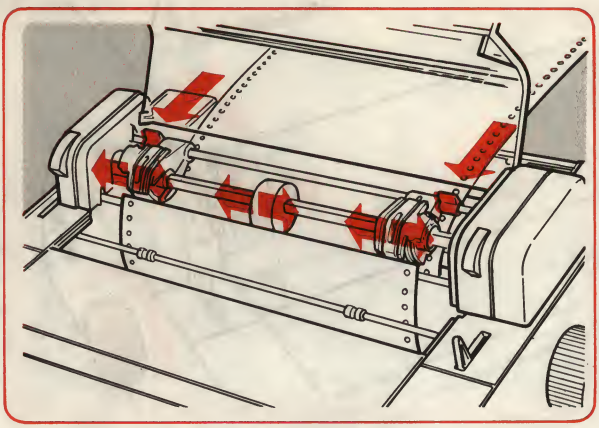


Fig. 3.48
Adjusting the tractors

Open the pin covers and align the lateral form perforations on the tractor pins.

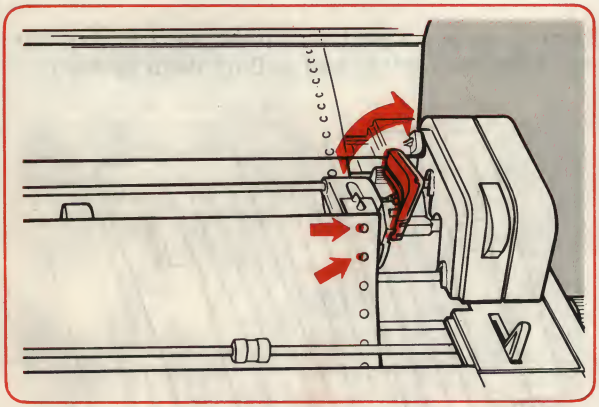
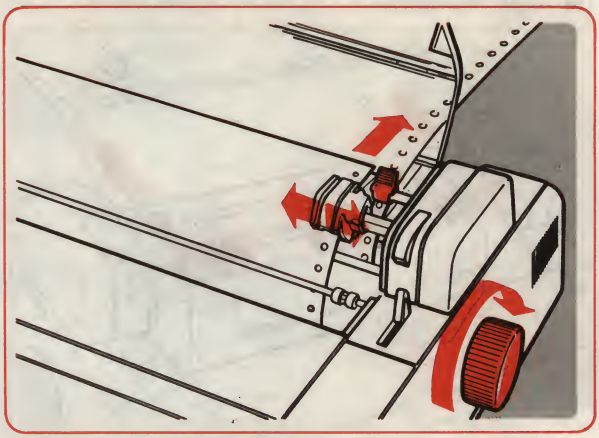


Fig. 3.49
Hooking up the continuous form

Close the pin covers, advance the paper and tighten it horizontally. Lock the two tractors by means of their levers.
Push the paper bail lever towards the back of the printer.

Fig. 3.50
Locking the tractors



Close the tractor's transparent cover, and make sure that nothing is blocking the paper feed path.

Remove the paper guides from the paper feed, grasping their lower edges and pulling them upwards.

Fig. 3.51
Removing the paper guides

Mount the paper feed unit in the grooves on the rear of the tractor device.

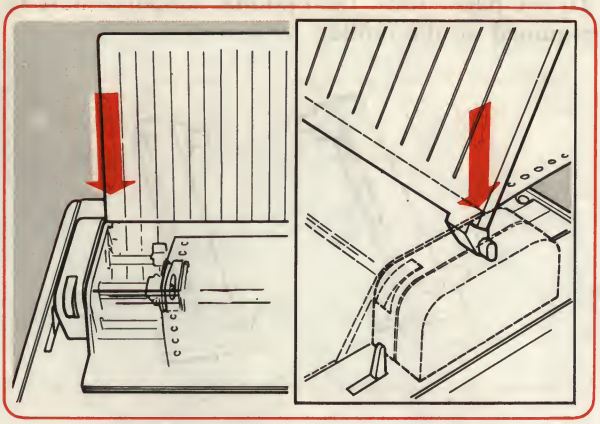


Fig. 3.52
Inserting the paper feed unit

Fix the paper feed unit so that it is sloping. Make sure nothing is blocking the paper feed path.

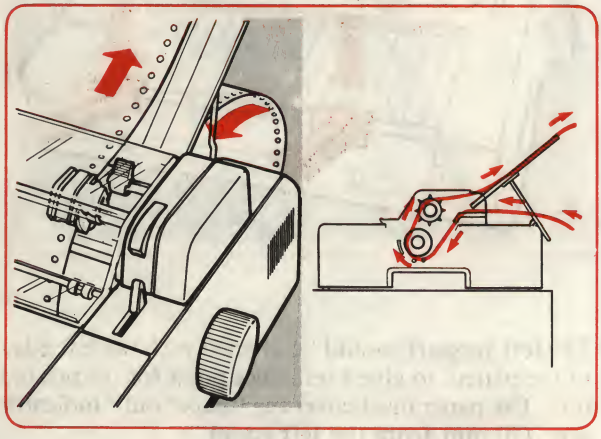


Fig. 3.53
The paper path

Paper Roll

To use paper rolls, the optional supports must be mounted on the printer.

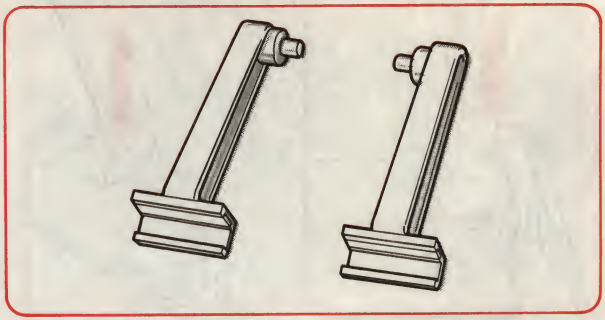


Fig. 3.54
The paper roll supports

To mount the paper roll supports, proceed as follows:

Secure the two paper roll supports to the guide on the upper rear edge of the printer, pressing them down and towards the printer to fix them into place.

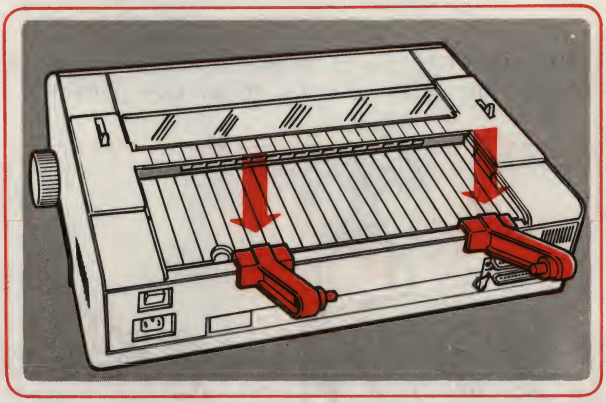


Fig. 3.55
Mounting the paper roll supports

The left support should be aligned with the left edge of the platen, to give a reference point for the printed text. The paper must cover the "paper out" indicator area (70 mm from the left edge).

Insert the paper roll between the two supports, adjusting the right support according to the roll width.

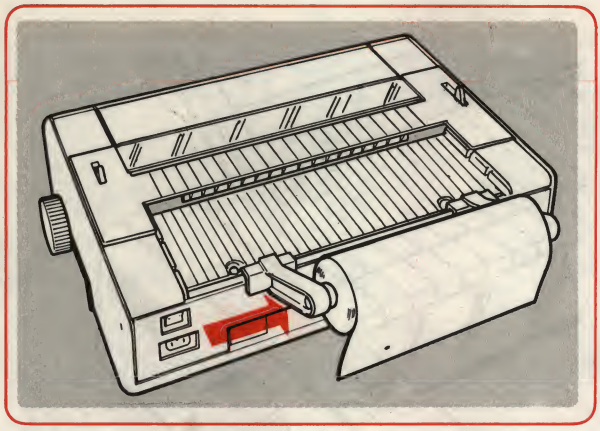


Fig. 3.56
Inserting the paper roll

Push the paper release lever towards the rear of the printer in order to allow paper feed from the roll.

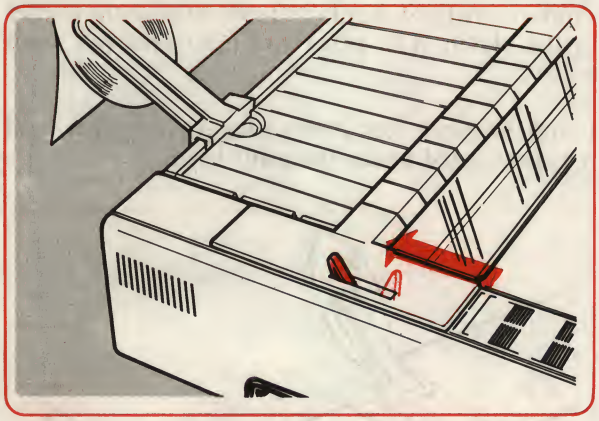
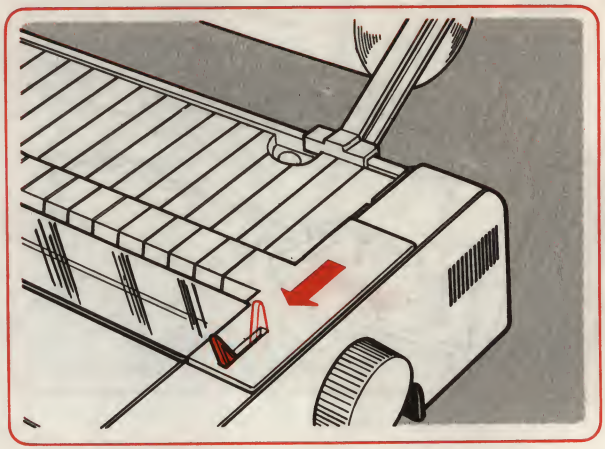


Fig. 3.57
Positioning the paper release lever

Push the paper bail lever towards the front of the printer to release the upper pressure rollers so that the paper can be inserted.

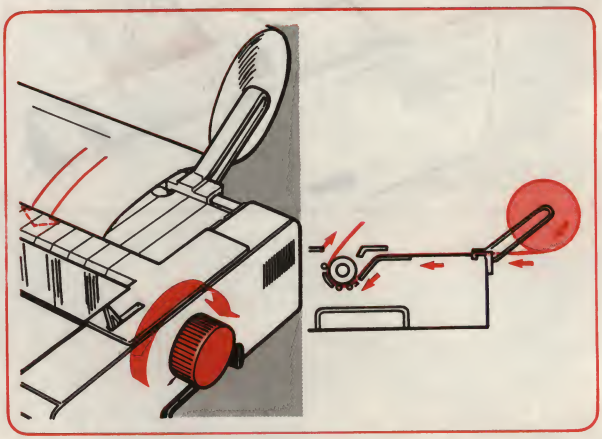
Fig. 3.58
Positioning the paper bail lever



Unwind some paper from the roll and insert it in the slot in the rear of the printer casing where the rolls supports are fixed. Feed the paper through the printer to the platen. The paper roll must feed out from below.

Using the paper feed knob, advance the paper until it is positioned under the print head.

Fig. 3.59
Paper feed-through



Turn the paper feed knob until the paper exits from the front slot, then push the paper bail lever towards the rear of the printer.

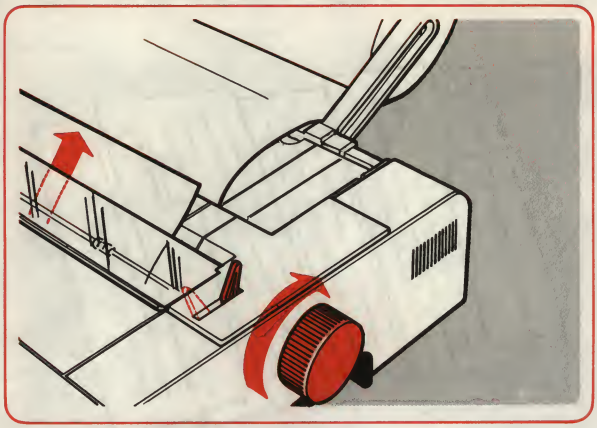


Fig. 3.60
Positioning the paper

Push the paper release lever towards the front of the printer, and align the paper correctly by overlapping the leading edge with the paper roll.

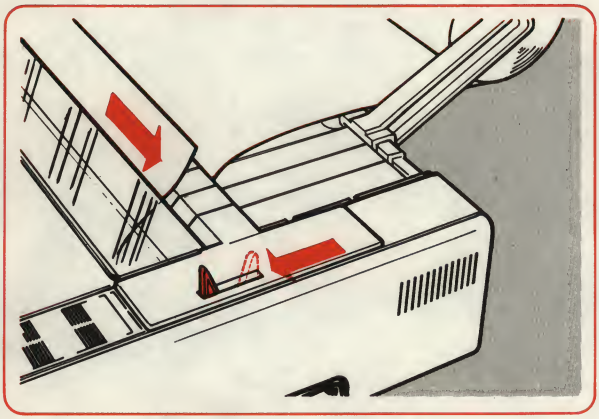


Fig. 3.61
Paper alignment

Push the paper release lever towards the rear of the printer so that the paper is fed through by the platen. Remove the paper guides from the paper feed grasping their lower edges and pulling them upwards.

Fig. 3.62
Removing the paper guides

Insert the paper feed unit in the front mountings. The path of the paper should be as shown in the following figure.

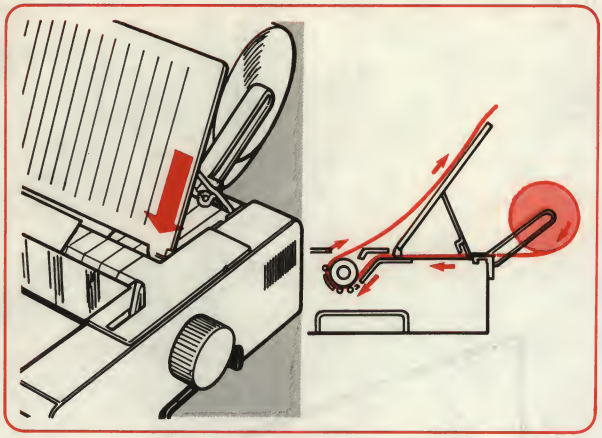
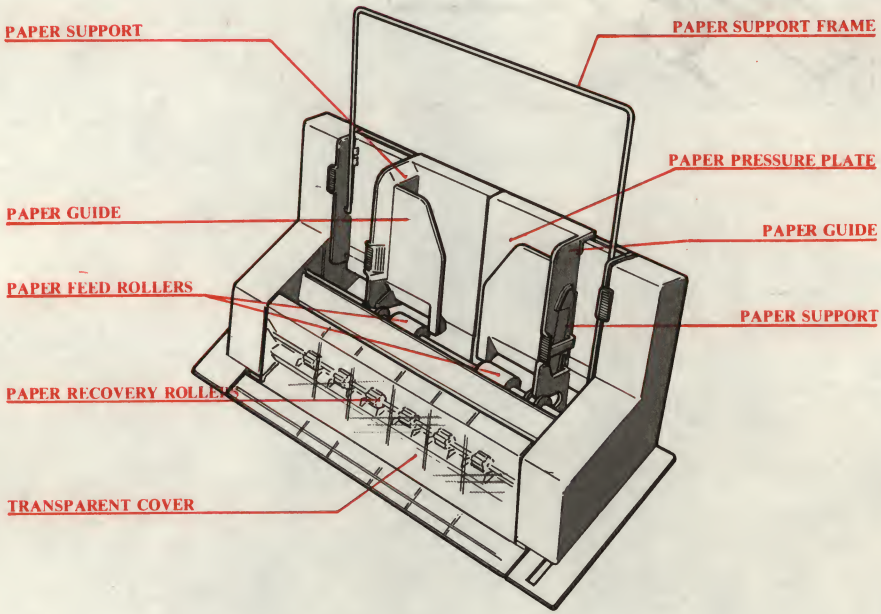


Fig. 3.63
Inserting the paper feed unit and the paper path

Automatic Sheet Feed

The optional automatic sheet feed allows automatic insertion of single sheets of paper from 1 or 2 paper trays.

Fig. 3.6 4
Automatic Sheet Feed



Installing Automatic Sheet Feed

To mount the automatic sheet feed on the printer, proceed as follows:

Remove the top cover (pressure-mounted on the printer casing) to access the internal paper feed area and the automatic front feed mounting hooks. Grasp the cover by its middle section and pull it slightly upwards.

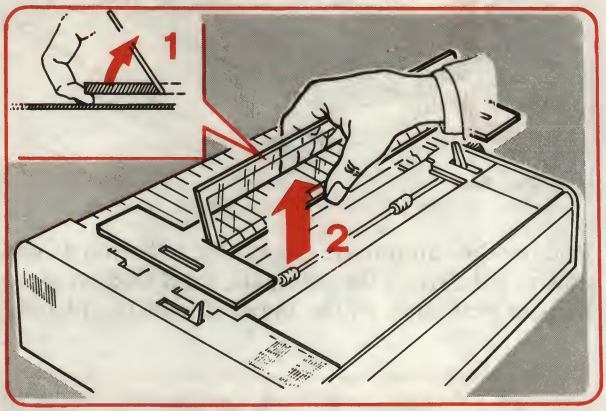
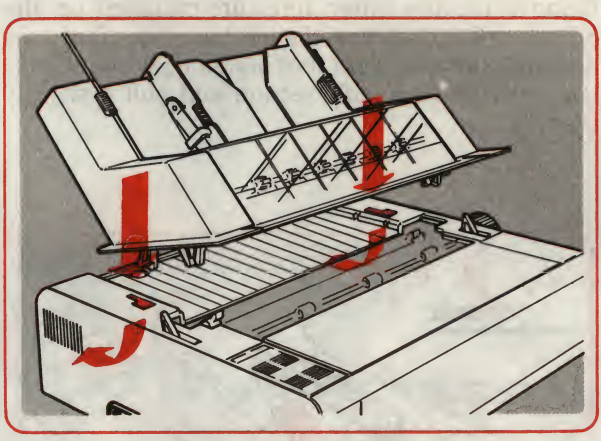


Fig. 3.65 Removing Top Cover

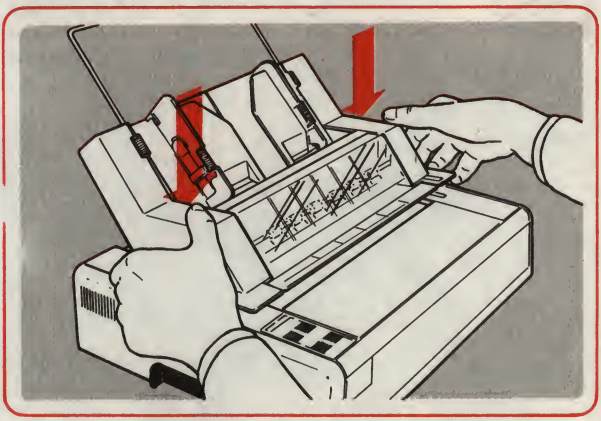
Position the automatic sheet feed so that its hooks are pointing downwards over the mounting slots, accessible now that the top cover has been removed. Push it downwards, inserting the hooks in the slots, sliding them in the guides.

Fig. 3.66
Inserting Automatic Sheet Feed



Rotate the automatic sheet feed forward and downwards. Hook the automatic sheet feed on to the hubs at both ends of the upper side of the platen.

Fig. 3.67
Fixing Automatic Sheet Feed in Position



Make sure the automatic sheet feed is fixed properly, by turning the paper feed knob. If the automatic sheet feed is positioned correctly, the feed mechanism will operate smoothly; if not, repeat the entire automatic sheet feed installation operation carefully.

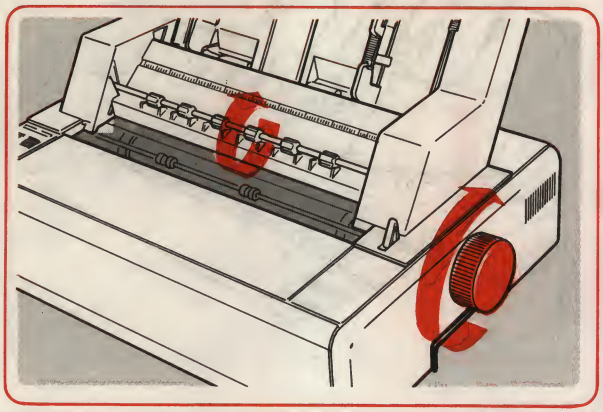


Fig. 3.68
Check Automatic Sheet Feed Movement

Removing the Automatic Sheet Feed

To remove the automatic sheet feed, proceed as follows:

Tip it backwards and upwards, rotating it on its rear hooks.

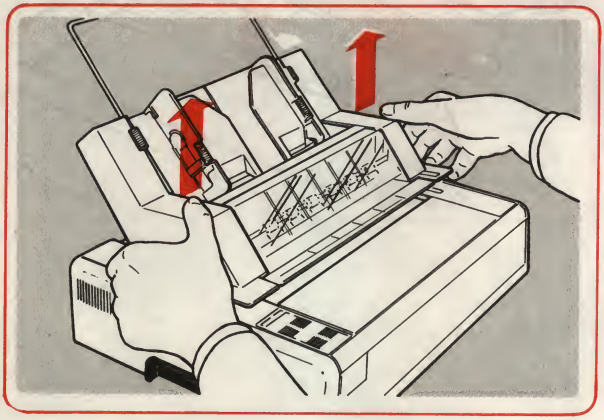
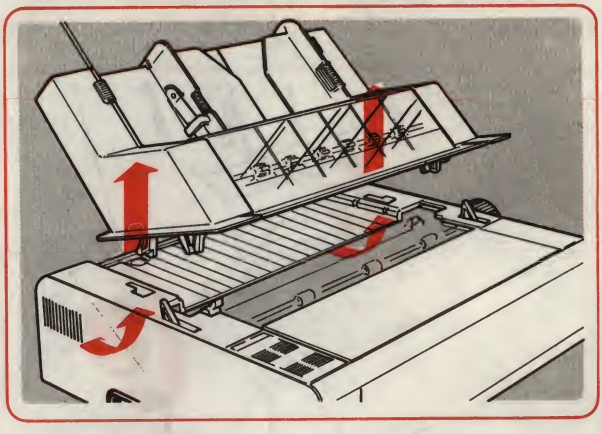


Fig.3.69
Releasing Automatic Sheet Feed

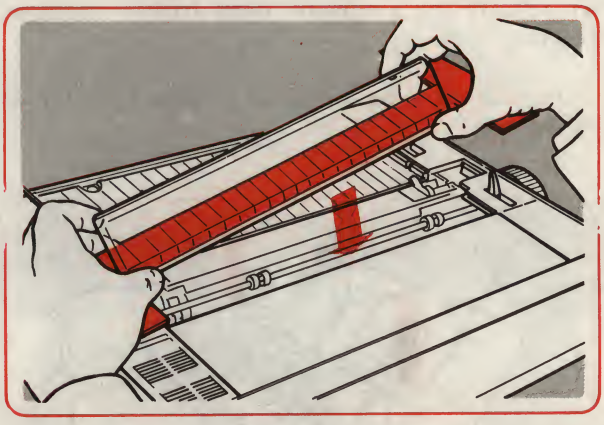
Lift off the automatic sheet feed, by pulling it forwards and sliding the rear hooks out of their slots.

Fig. 3.70
Removing Automatic Shee Feed



Replace the top cover, pressing it gently into position.

Fig. 3.71
Replacing Top Cover



Loading Paper into Automatic Sheet Feed

The paper can be loaded only after the automatic sheet feed has been installed.

To load the paper ream, proceed as follows:

Push the paper release lever towards the rear of the printer.

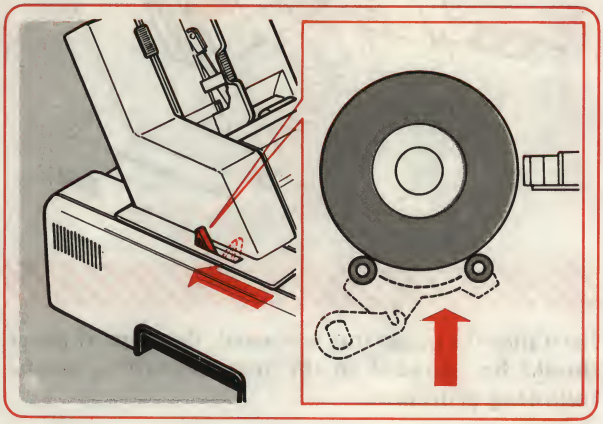


Fig. 3.72
Positioning Paper Release Lever

Insert the paper bail on the automatic front feed in the pair of holes in the sides of the lateral paper guides most suited to the type of paper used (the bail should be adjusted according to the paper length).

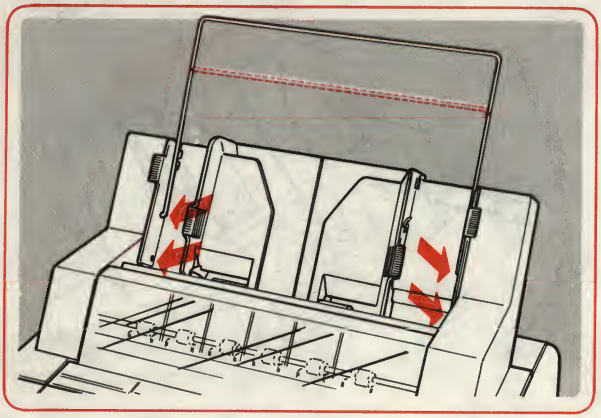
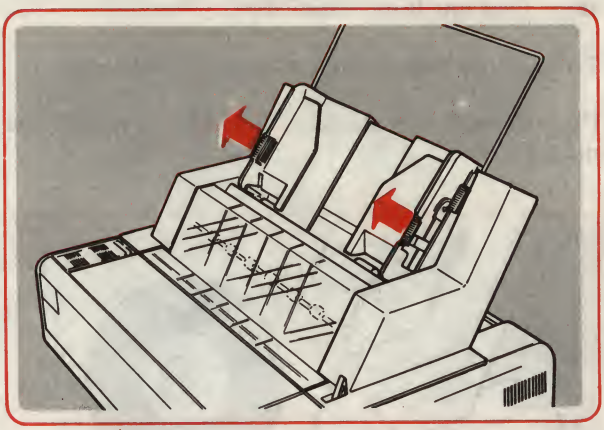


Fig. 3.73
Inserting Automatic Feed Paper Bail

Open the paper tray, by pushing the lateral paper guides (and the paper pressure plate, with which they are connected) towards the front of the printer.

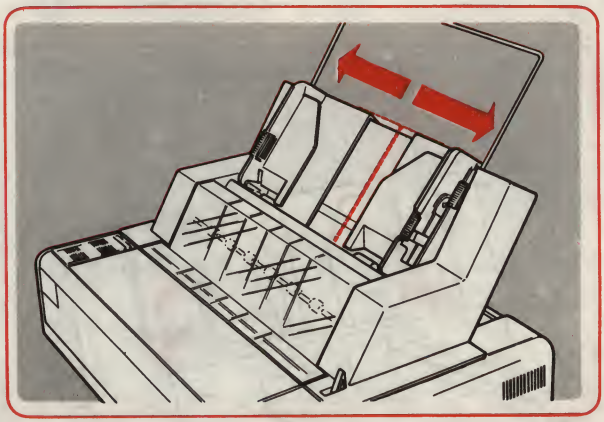
Fig. 3.74
Opening Paper Tray



Each time the paper tray is opened, the ream of paper should be reloaded in the tray, according to the following procedure.

Adjust the position of the lateral guides according to the paper width used, moving them along the toothed guide.

Fig. 3.75
Adjusting Lateral Guides



The sheets of paper should be aligned with the left edge of the platen, to give a reference point for the printed text (there is a graduated scale on the automatic sheet feed to simplify paper alignment). The paper must cover the "paper out" indicator area (70 mm from the left edge).

Leaf the ream of paper to be load, and then realign the sheet edges.

Fig. 3.76
Leafing Paper Ream

Load the ream of paper into the feed tray, making sure it does not force against the guides, nor that it has too much play. Close the tray, by pushing the two lateral guides towards the rear of the printer.

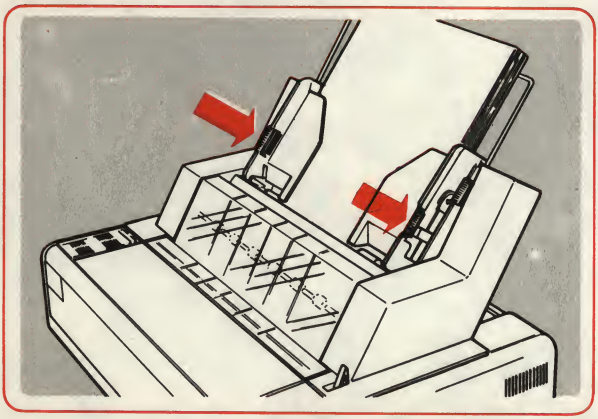


Fig. 3.77
Inserting Paper and Closing Tray

Headed paper should be inserted with the heading facing downwards and towards the rear of the tray.

Paper can be loaded into the automatic sheet feed with the printer either off or on.

If the automatic sheet feed with two trays is mounted and programmed for paper feed from loaded tray (see the chapter: Programming the Printer), continuous automatic sheet feeding is possible without interruption of the printing operation.

When the automatic sheet feed is loaded, the printer firmware and the software application program control the paper handling (feed-in, linespacing, sheet expulsion), until the paper supply runs out.

If a sheet of paper jams, the "paper out" signal is not given; the printer goes into LOCAL and an acoustic signal sounds. To resume printing, remove the jammed paper (removing and reinstalling the automatic sheet feed device, if necessary) and then press the LOCAL key.

Do not switch on the printer until you have read the explanations in the following chapters carefully.

The keys will operate only if the printer is switched on.

Set the dip switches on the right side of the back of the printer before switching the machine on. Their setting defines various operation modes.

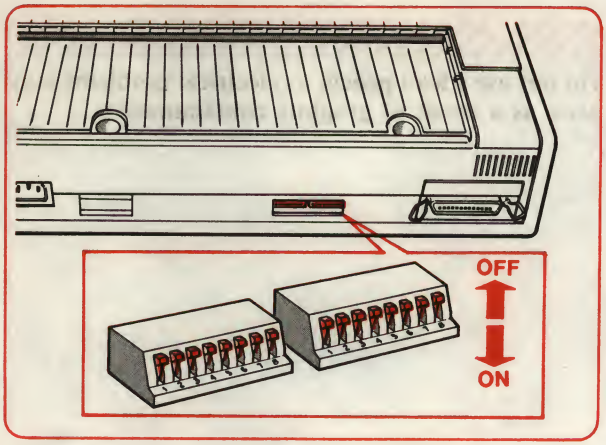


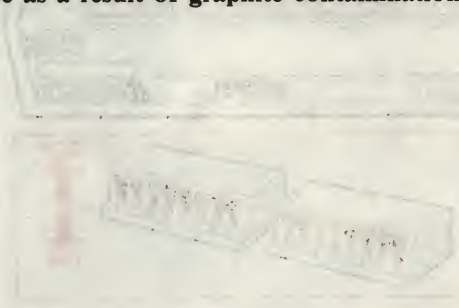
Fig. 3.78 Location of the dip switches

There are two dip-switch banks, each with 8 switches; bank 2 at the right side to organise printing (form length, line space, etc.) and bank 1 at the left side to select print mode: regular (DRAFT) or NLQ (Near Letter Quality), to select automatic paper feed and national variants.

With NLQ mode, the setting of BIT IMAGE, DOUBLE WIDTH and UNDERLINE printing mode is also possible.

The switches of each bank are identified by numbers (1 to 8 from left to right) and each has two positions indicated by the words OFF and ON. Use a small screwdriver or a ball point pen to set the dip switches.

Do not use a lead pencil, as electrical problems may arise as a result of graphite contamination.



A description of the function of each switch on the two DIP-SWITCH banks follows.

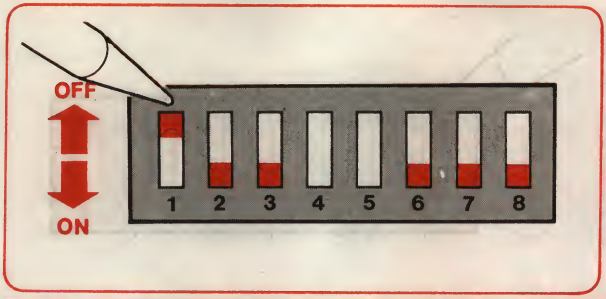


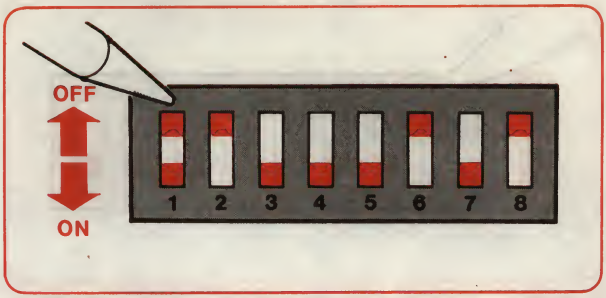
Fig. 3.79 Presetting the dip switches

NO.	FUNCTION	MEANING
1 SW 1	Printing mode	ON NLQ OFF Regular (DRAFT)
1 SW 2	ASF - Automatic sheet feeder enabled	OFF ASF-Automatic Sheet Feed ON Rear Feed/Tractor Feed
1 SW 3	Sheet feed with ASF installed	ON Feeds a sheet of paper from the selected bin OFF Feeds a sheet of paper automatically from the loaded bin. When a PAPER EMPTY condition occurs in one bin, the sheet of paper is automatically fed on to the bin loaded with paper.
1 SW 4 1 SW 5	not used	

1 SW 6	1 SW 7	1 SW 8	
ON	ON	ON	International (IBM)
ON	ON	OFF	Denmark, Norway
ON	OFF	ON	Israel
ON	OFF	OFF	Greece
OFF	ON	ON	Portugal
OFF	ON	OFF	Spain
OFF	OFF	ON	International (IBM)
OFF	OFF	OFF	International (IBM)

If you wish to change the basic configuration of the printer adjust the dip-switches before switching on the machine.

Fig. 3.80 Presetting the dip switches



NO.	FUNCTION	MEANING
2 SW 1	Form length	ON 304,8 mm (12'') OFF 279,4 mm (11'')
2 SW 2	Line feed value	ON 3,17 mm (1/8'') OFF 4,23 mm (1/6'')
2 SW 3	Position of lower margin (BOF)	ON 25,4 mm (1'') OFF 0 mm (0'')
2 SW 4	Characters selection guide (see appendix)	ON IBM 2 international and national variants (see Dip switch 6-7-8 Bank 1) OFF IBM 1 International
2 SW 5	CAN execution (CANCEL: see command codes)	ON CAN executed OFF CAN ignored
2 SW 6	AUTO-FEED (see appendix)	ON CR = CR OFF CR = CR + LF
2 SW 7	Control	SW 7 SW 8
2 SW 8	Printer selection	ON ON not in use ON OFF printer always selected OFF ON selection of the printer according to signal ''select'' OFF OFF printer not selected

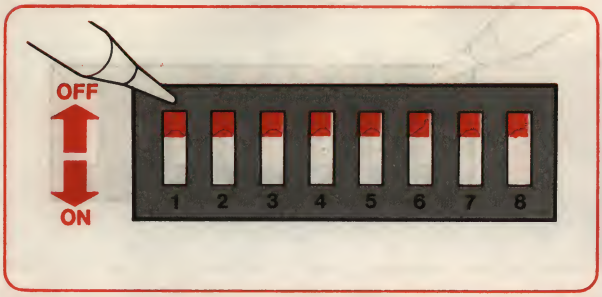


Fig. 3.81 Presetting the dip switches

NO.	FUNCTION	MEANING
1 SW 1	Printing mode	ON NLQ OFF Regular (DRAFT)
1 SW 2	Automatic sheet feed (ASF)	ON Not present OFF Present
1 SW 3	Form length	ON 304.8 mm (12'') OFF 279.4 mm (11'')
1 SW 4 1 SW 5	Printing pitch	2SW4 2SW5 OFF OFF Pica OFF ON Condensed ON OFF Emphasized ON ON Elite

1 SW 6	1 SW 7	1 SW 8	National Variants IBM	EPSON
ON	ON	ON	International	Italy
ON	ON	OFF	Denmark	Denmark
ON	OFF	ON	Israel	Sweden
ON	OFF	OFF	Greece	Germany
OFF	ON	ON	Portugal	England
OFF	ON	OFF	Spain	Spain
OFF	OFF	ON	International	France
OFF	OFF	OFF	International	USA

If you wish to change the basic configuration of the printer adjust the dip-switches before switching on the machine

Fig. 3.82
Presetting the dip switches

NO.	FUNCTION	MEANING
2 SW 1	Zero font	ON with slash (Ø) OFF not slashed (0)
2 SW 2	Character generator	ON IBM OFF EPSON
2 SW 3	Position of lower margin (BOF)	ON 25,4 mm (1'') OFF 0 mm (0'')
2 SW 4	Characters selection guide (see appendix)	ON table 2 OFF table 1
2 SW 5	Buzzer	ON valid OFF invalid
2 SW 6	AUTO-FEED (see appendix)	ON CR = CR OFF CR = CR + LF
2 SW 7	Control	SW 7 SW 8
2 SW 8	Printer selection	ON ON not in use ON OFF printer always selected OFF ON selection of the printer according to signal "select" OFF OFF printer not selected

The printer programming procedure consists of accepting or ignoring a series of parameters proposed by printer firmware. Once the selection has been made, it will be stored in the printer, and will remain valid until a new selection is made.

As the selection made will always be printed out, the ribbon cartridge and a sheet of paper **MUST** be loaded in the printer.

1. Switch the printer OFF
2. Hold down both the Line Feed (LF) and Form Feed (FF) keys, and switch ON the printer. The following phrase will be printed (example for IBM environment):

   THIS IS A DUAL INTERFACE PRINTER

   To confirm, press LF; to change, press FF; to end, press S.L. (Sheet Load)

   NEAR LETTER QUALITY MODE:

   NO

3. If you do not wish to print in NLQ mode (thus accepting the alternative setting), press LF. The next selection parameter will be printed **(AUTOMATIC SHEET FEED : NO)**

   If you want NLQ printing (thus ignoring the alternative choice), press FF.

   NEAR LETTER QUALITY MODE:

   NO/ YES

   The parameter selection proposal will be the alternative of the parameter stored previously. I.e. if NLQ printing mode was selected in the previous programming cycle, the following phrase will be printed at beginning:

   NEAR LETTER QUALITY MODE:

   YES

4. Proceed as in point 3, selecting or ignoring all the parameters proposed. (The programming parameters will vary according to the printer operating environment: IBM or EPSON).

PARAMETERS	ALTERNATIVES		
Near Letter Quality Mode	NO	YES	
Automatic Sheet Feed	NO	YES	
Automatic Toggle on Hoppers (only if Automatic Sheet Feed is Selected)	YES	NO	
Form Length	12 in	11 in	
Linespace	6 lpi	8 lpi	
Skip over Perforations	YES	NO	
Character Set	1	2	
CAN Code	Enabled	Disabled	
National Character Set	International	Denmark	Israel
	Greece	Portugal	Spain
Data I/O	RS 232C	CX	
Invert Auto LF Signal (only if CX is Selected)	NO	YES	
Strobe Signal Active on Rising Edge (only if CX is Selected)	YES	NO	
Select IN Signal (only if CX is Selected)	Enabled	Disabled	

EPSON Environment

PARAMETERS	ALTERNATIVES
Print Mode at Power ON	10 char/in | 17.1 char/in | Emphasized
Zero with Slash	NO | YES
Paper-End Detector	Enabled | Disabled
Input Buffer	Enabled | Disabled
Buzzer	Enabled | Disabled
Automatic Line Feed	NO | YES
Automatic Sheet Feed	NO | YES
Automatic Toggle on Hoppers (only if Automatic Sheet Feed is Selected)	YES | NO
Form Length	12 in | 11 in
Linespace	6 lpi | 8 lpi
Skip over Perforations	YES | NO
Character Set	1 | 2
CAN Code	Enabled | Disabled
National Character Set	USA | France | Germany | Great Britain Denmark | Sweden | Italy | Spain | Japan
Data I/O	RS 232C | CX
Invert Auto LF Signal (only if CX is Selected)	NO | YES
Strobe Signal Active on Rising Edge (only if CX is Selected)	YES | NO
Select IN Signal (only if CX is Selected)	Enabled | Disabled

To interrupt or terminate printer programming at any point, press S.L.

When programming is terminated, the following phrase is printed:

Would you like to store these parameters?

YES

If the parameters selected are to be stored, press LF (*PARAMETERS STORED* will be printed); otherwise press FF and the following phrase will be printed:

Would you like to store these parameters?

YES/NO

NO CHANGES EXECUTED

You can print out all the parameters and their alternatives, which can be programmed on the printer (updated to the printer production level), using the following procedure (example for IBM environment):

THIS IS A DUAL INT. PRINTER

To confirm, press LF; to change, press FF; to end press S.L.

NEAR LETTER QUALITY MODE:
NO

NEAR LETTER QUALITY MODE:
NO/ YES

AUTOMATIC SHEET FEED:
NO

AUTOMATIC SHEET FEED:
NO/ YES

AUTOMATIC TOGGLE ON HOPPERS:
YES

AUTOMATIC TOGGLE ON HOPPERS:
YES/ NO

FORM LEN.:
12 INCHES

FORM LEN.:
12 INCHES/ 11 INCHES

LINE SP.:
6 LPI

LINE SP.:
6 LPI/ 8 LPI

SKIP OV. PERF.:
YES

SKIP OV. PERF.:
YES/ NO

CHR. SET:
1

CHR. SET:
1/ 2

CAN CODE:
ENABLED

CAN CODE:
ENABLED/ DISABLED

NATIONAL CHAR. SET:
INTERNATIONAL

NATIONAL CHAR. SET:
INTERNATIONAL/ DENMARK

NATIONAL CHAR. SET:
INTERNATIONAL/ DENMARK/ ISRAEL

NATIONAL CHAR. SET:
INTERNATIONAL/ DENMARK/ ISRAEL/
GREECE

NATIONAL CHAR. SET:
INTERNATIONAL/ DENMARK/ ISRAEL/
GREECE/ PORTUGAL

NATIONAL CHAR. SET:
INTERNATIONAL/ DENMARK/ ISRAEL/
GREECE/ PORTUGAL/ SPAIN

DATA I/O:
CX

INVERT SIG. AUTO LF:
NO

INVERT SIG. AUTO LF:
NO/ YES

STROBE SIG. ACT. ON RIS. EDGE:
YES

STROBE SIG. ACT. ON RIS. EDGE:
YES/ NO

SELECT IN SIGNAL:
ENABLED

SELECT IN SIGNAL:
ENABLED/DISABLED

Would you like to store these parameters?
YES

* PARAMETERS STORED *

* OR

STROBE SIG. ACT. ON RIS. EDGE:
YES/ NO

Would you like to store these parameters?
YES

Would you like to store these parameters?
YES/ NO

* NO CHANGES EXECUTED *

Connection to Mains Power Supply

4/1

After correctly loading ribbon cartridge and paper into the printer and setting various mechanical controls for printing, connect the printer to mains power supply.
Check the technical data on the plate at the back of the printer.

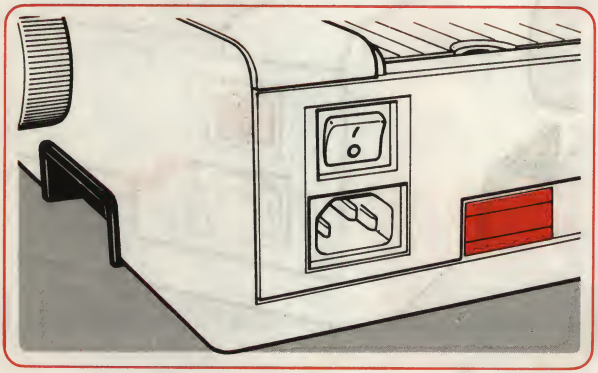


Fig. 4.1
Mains supply data plate

This shows the required voltage; make sure that the supply voltage available corresponds to the voltage indicated on the plate.

Check also that the socket to be used is grounded and fits the special plug of the printer power supply cable (which should comply with the standard for the country in which the machine is purchased).

If this is not the case, contact the After Sales Service or the dealer from whom the printer was purchased and do not attempt to connect the printer.

To switch the printer on, proceed as follows:

Switch the printer off by pressing the key with the symbol "0".

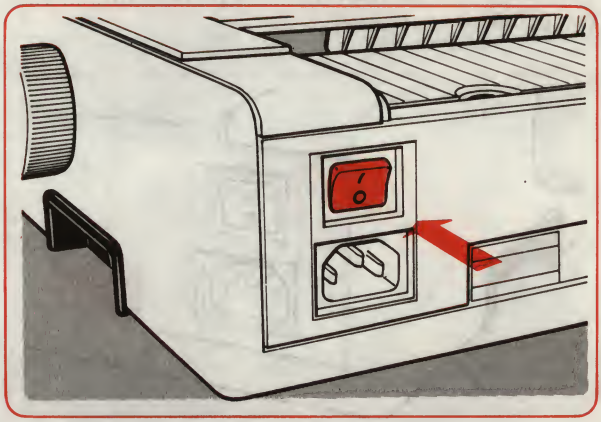


Fig. 4.2
Switching the printer off

Insert supply cable plug into the socket on the rear of the printer.

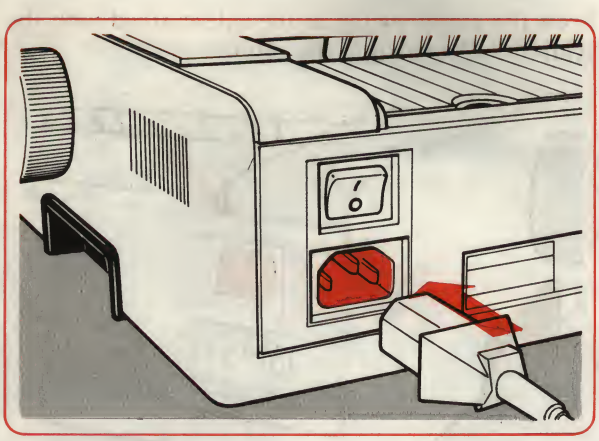


Fig. 4.3
Inserting the power supply cable

Connect the power supply cable plug to the wall socket.

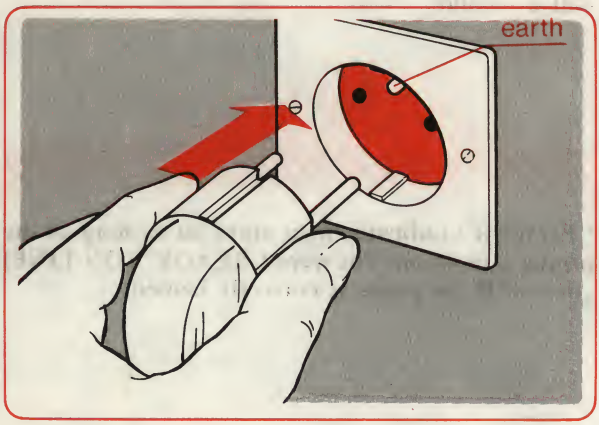


Fig. 4.4
Connection to the mains

Press the mains switch at the side marked with the symbol "I" to switch the printer on.

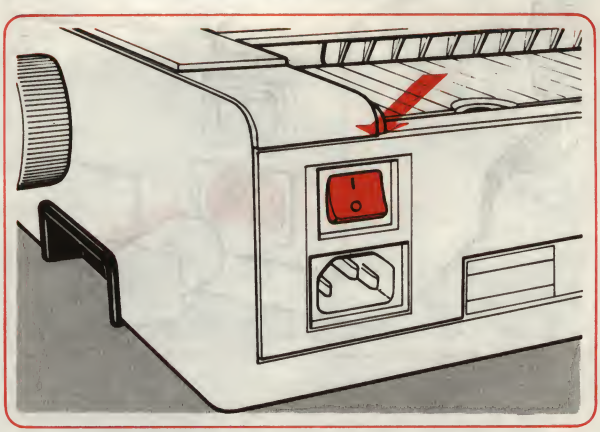


Fig. 4.5
Turning on the switch

The "POWER light on the console will come on and the printing head will move to the left side ready to print on paper. An acoustic alarm rings for about half a second.

"POWER" indicator light stays on as long as the printer is powered. The word "READY" (ON-LINE) goes on if the paper is correctly loaded.

Autodiagnostics

5/1

Whenever the printer is switched on, it automatically undergoes a sequence of operations called "initiating" consisting of the following phases (this sequence can also be started by sending the signal INIT, as described in the appendix):

The printer performs a self check. Failures are shown by the indicator lights on the console according to a specific pattern.
Note the position of the illuminated indicator lights and contact the After Sales Service.

The printing head moves to the first printing column (at the extreme left hand margin).

Horizontal and vertical spacing are automatically set at normal values (usually 1/6 in. and 10 char/in. respectively).

Controls set by microswitches are memory loaded.

The printer automatically switches to on-line mode provided the paper has been correctly loaded.

Switching the printer off clears from the memory any preset tabulation program, any printing characters and eventual graphic settings stored in the buffer.

Other Characteristics of the Printer

Acoustic Alarm (Buzzer)
The printer is equipped with an acoustic alarm which buzzes for about half a second if the BEL signal has been given (see control code).
The alarm also buzzes for half a second when the printer is switched on, and buzzes intermittently in cases of paper shortage or incorrect operating procedure.

Paper Shortage.
When loaded paper is nearing the end (only about 70 mm of paper left), the printer stops and automatically transfers this information to the computer.

The acoustic alarm begins buzzing intermittently and both "PAPER-EMPTY" and "LOCAL" indicator lights go on. Printing can be resumed after loading more paper, without switching the printer off since this would clear the settings and printing buffer content from the memory .

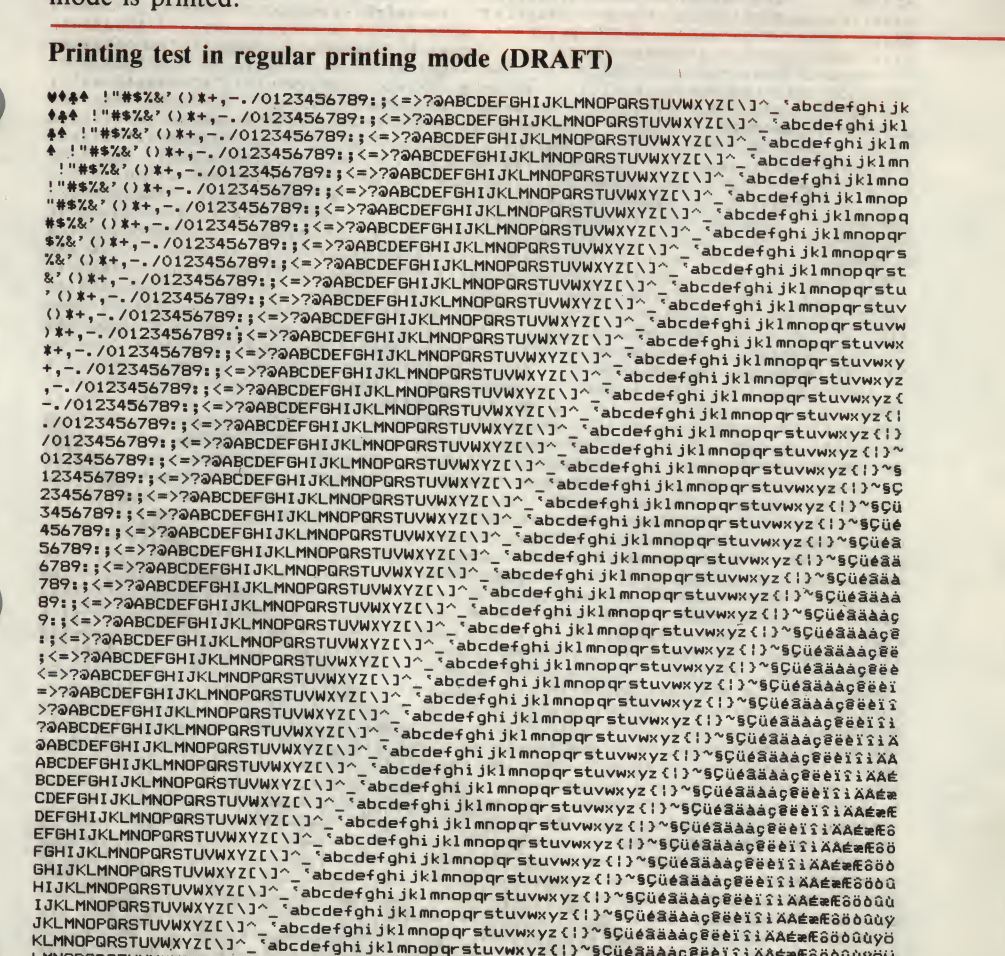
Pressing the switch "SHEET-LOAD", paper is automatically loaded again and the acoustic alarm is stopped. Pressing the "LOCAL" key, the indicator light will go off and printing is resumed. The PAPER EMPTY alarm can be eliminated with the ESC Q code (see control codes).

Printing Test
Holding the "LINE-FEED" key pressed while switching the printer on instructs the printer to print a self test.

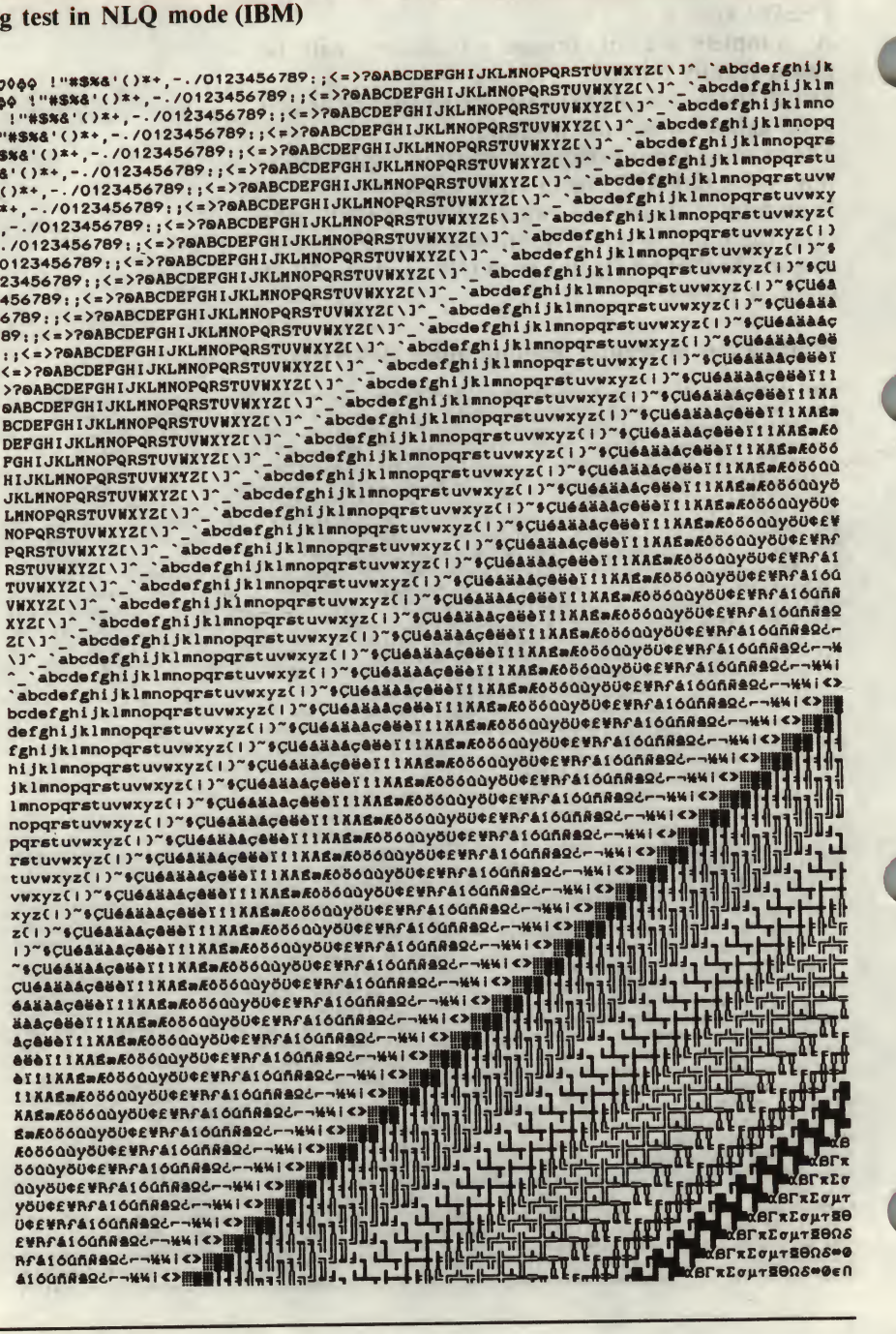
The test is performed only if paper and ribbon are correctly loaded and the automatic checking program has been satisfactorily performed (see initiating the printer).

Once the print-out has started, release the "LINE-FEED" key.
A complete set of printed characters will be automatically printed.
Switch the printer off to stop printing test and switch it on again for normal operation.
The printing test is performed either in regular printing mode (DRAFT) or in NLQ mode.
With printer on and dip-switch 2 SW1 in OFF position, the printing test is performed in regular printing mode (DRAFT); if it is in ON position, NLQ mode is printed.

Printing test in regular printing mode (DRAFT)



Printing test in NLQ mode (IBM)



The printer is connected to the computer by means of a cable. This must be plugged in the socket provided and fastened with the two side spring clips.

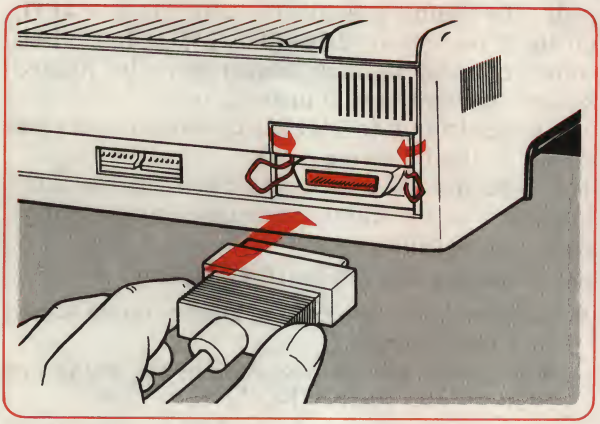


Fig. 6.1
Connection to the computer

The socket at the printing unit end is of the female type and fits a STANDARD data transfer system. The computer must be equipped with a parallel interface to guarantee a direct dialogue with the printer.

When using cables shorter than one metre, a standard multiwire cable can be used, but for longer connecting cables we recommend a "TWISTED-PAIR" cable.

The cable must end with two male connectors fitting the female socket in the printer and in the computer.

Never use a cable longer than three metres. Contact the dealer's After Sales Service for advice if in doubt.

Printer Control via Computer **6.1**

Instructions for printing are sent to the printer in the form of bytes, i.e. groups of eight bits, transferred simultaneously through the cable connection.

The coding system used is called ASCII and is based on the relationship between bits and characters (for example, the letter A corresponds to the byte 01000001). The equivalent code for each character is given in the appendix.
To avoid always writing the full sequence of eight bits, decimal equivalents will be used; the number precedes the letter D, (A = 65 D), or the hexadecimal code - the number precedes the letter H (A = 41 H).
Of the 256 codes available (0 ÷ 255D ; 0 ÷ FFH), some represent normal characters to be printed, others represent special instructions.
The codes from 0 to 31D are command codes (see details in the following part).
The codes from 32D to 255D are printing characters (numbers, capital letters, punctuation marks, forms, etc.), (see appendix).

Before proceeding any further please note:

- the printer can also print in graphic mode besides printing characters.
  This mode will be described in the paragraph "GRAPHIC PRINTING".
- The length of the printed line is equal to 80 characters (increaseable to 132 with special instructions). Characters are transferred to the print buffer. When this is complete, the entire line is printed and the machine is ready to memorize new characters.
- Code 27D (ESC) is a special code and each character immediately following it is also particularly treated. The code ESC n (where n is a character with a code from 0 to 127D) is called "ESCAPE SEQUENCE". The printer recognises 28 different escape sequences described in a specific paragraph.
- By pressing and holding down the FORM FEED key and simultaneously switching the printer on, the operator obtains a print-out in hexadecimal code of all the data received from the computer (for example, if the computer transfers the characters BAC, the hexadecimal numbers 42 41 43 will be printed).

Printing in hexadecimal code occurs automatically only if data transmitted exceeds the maximum length of the printing line.

As already mentioned, the command codes consist of one or more bytes (characters).

The codes recognised by the printer are grouped according to their functions.

The symbol "n", used in some of the codes, indicates a character whose decimal code is "n".

Index

A. PRINTING TYPES

Near Letter Quality (NLQ)

ESC G	27 D, 71 D	Sets NLQ printing mode, and enables change from Draft printing mode to NLQ via software.
ESC H	27 D, 72 D	Sets Draft printing mode, and enables changes from NLQ printing mode to Draft via software.

Enlarged

SO	(14D)	**Shift Out** Sets enlarged (double width) printing mode. This program is cleared with DC4, CAN and also at the end of the line (CR or LF) (see also escape sequence).
DC 4	(20D)	**Device control 4** Clears enlarged printing mode.
ESC W 1	(27D,37D,49D)	Sets enlarged printing mode. Characters are printed in double width and therefore each line will contain half the normal number of characters. Remains valid until receiving code ESC W 0.
ESC W 0	(27D,87D,48D)	Clears enlarged printing mode.

Condensed

SI	(15D)	**Shift IN** Sets condensed printing mode (17.1 char/inch). Is cleared by code DC2, CAN and also at the end of the line (CR or LF), (see also escape sequence). **Enlarged mode is also available with condensed characters.** **THIS CODE WILL BE IGNORED IF "NLQ" MODE IS ON.**
DC2	(18D)	**Device control 2** Clears condensed printing mode.

Underline

ESC-1	(27D,45D,49D)	Sets underline printing and keeps operating until code ESC 0 has been given.
ESC-0	(27D,45D,48D)	Clears underlining.

Emphasized

ESC E	(27D,69D)	Sets emphasized printing mode, remains operative until code ESC F is received. **The emphasized printing mode reduces printing speed by 50% and if sent when set in combination with condensed printing mode changes the print pitch to normal (10 c.p.i.).** **THIS CODE WIL BE IGNORED IF "NLQ" MODE IS ON.**
ESC-F	(27D,70D)	Clears emphasized printing mode. **THIS CODE WILL BE IGNORED IF "NLQ" MODE IS ON.**

Superscripts/Subscripts

ESC S 0	(27D,83D,48D)	Sets printing of superscripts (half a line feed above the current line). Will be cleared by ESC T.
ESC S 1	(27D,83D,49D)	Sets printing of subscripts (half a line feed below); will be cleared by ESC T.
ESC T	(27D,84D)	Clears superscripts or subscripts.

B) LINE FEED VALUE

ESC 0	(27D,48D)	Sets 3.175 mm (1/8'') space between lines.
ESC 1	(27D,49D)	Sets 2.47 mm (7/72'') space between lines.
ESC 2	(27D,50D)	Sets 4.23 mm (1/6'') space between lines.
ESC 3(n)	(27D,51D, $1 \leq n \leq 255$D)	Sets 0.1176 x n mm (n/216'') space between lines.
ESC A(n)	(27D,65D, $1 \leq n \leq 85$)	Sets 0.3528 x n mm (n/72'') space between lines.

Must be followed by code ESC 2 to be operative.

Line feed values, 3.175 mm (1/8'') or 4.23 mm (1/6'') can also be set by dip switch.
See chapter 3.3.

C) PAPER FEED

LF	(10D)	**Line Feed** Prints characters stored in buffer and automatically proceeds to following line (ESC sequence).
FF	(12D)	**Form Feed** Prints characters stored in buffer and advances the paper to the first print line of the next form (Top of Form).

D) FORM CONTROL

I. HORIZONTAL

HT	(9D)	**Horizontal Tab** Prints characters starting from first available tabulation stop (according to ESC sequence).
ESC D **(n_1,n_2,..n_K)** **NUL**	((27D,68D, $1 \leq n_1..n_K \leq 254$, $1 \leq K \leq 28$,0D)	Sets horizontal tabulation program to a maximum of 28 tabulation stops. The decimal values of n must be sent in rising numerical order to address the column where the stop will be positioned (left margin has column 1). When switching the printer on the stops are set every 8 characters.

II. VERTICAL

Vertical Tabulation

VT	(11D)	Prints characters stored in buffer and automatically proceeds to the following line (ESC sequence) - same as LF.

Form length

ESC C(n)	(27D,67D, $1 \leq n \leq 127$)	Sets form length in number of line feeds (line feed value as preset).
ESC C **NUL(n)**	(27D,67D,0D, $1 \leq n \leq 22$)	Sets form length in inches. The form feed (FF) will be coherent with the form length defined with this program. Setting can be controlled with SW1 on the dip switches in 11'' or 12'' when switching the printer on.

Position of Lower Margin (BOF)

ESC N(n)	(27D,78D, $1 \leq n \leq 127$D)	Defines the number of lines, at the bottom end of the form, in which no printing is allowed and which will be automatically skipped (BOF = Bottom of Form). **Above-mentioned operation will be correctly carried out only when paper has been loaded in the top of form position.** **This instruction must be retransmitted if code ESC C has been used in the meantime as this code changes the form length value.** **BOF can be set by 1 SW3 on the dip switches at 0 or at 25.4 mm when switching on.**
ESC O	(27D,79D)	Clears BOF.

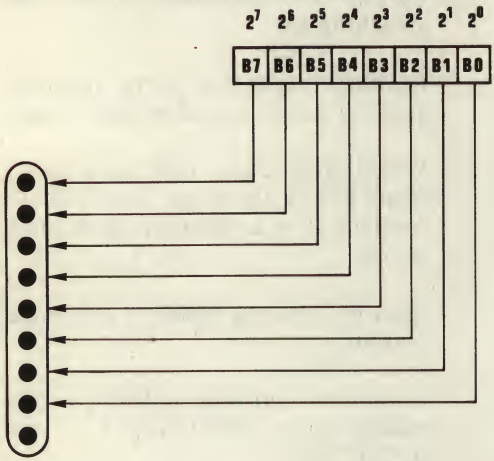
E) OTHERS

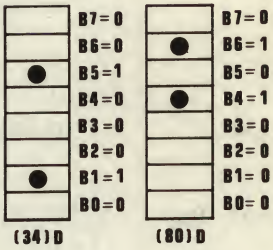
BEL	(7D)	**BEL** Activates alarm signal for about one second.
CR	(13D)	**Carriage Return** Prints buffer stored characters and brings printing head back to the left hand margin. If 1 SW6 on the dip switches is ON, the paper is automatically advanced one line feed.
CAN	(24D)	**Cancel** Clears printing buffer memory (data stored in the buffer are cancelled). Will be ignored if 1 SW5 on the dip switches is ON.
ESC 6	(27D,54D)	Selects table 2 of the character set (see appendix).

ESC 7	(27D,55D)	Selects table 1 of the character set (see appendix).
		The table indicated by 1 SW4 on the dip switches is automatically set when switching on.
ESC 8	(27D,56D)	Excludes paper out signal (printing goes on until the end of last form).
ESC 9	(27D,57D)	Clears instruction ESC 8; printing stops before the paper end and the machine gives an intermittent acoustic signal.
ESC <	(27D,60D)	Returns printing head to left hand margin.
ESC J(n)	(27D,74D, $1 \leq n \leq 255$)	Commands printing buffer and advances paper by 0.1176 x n mm (n/216''). DOES NOT change line feed value (as with ESC 3).
ESC U 1	(27D,85D,49D)	Sets monodirectional printing (left to right) to ensure correct alignment of the text.
ESC U 0	(27D,85D,48D)	Sets bidirectional printing (faster).
ESC t 0	(27D,116D,48D)	Selects first tray of automatic sheet feed (default value).
ESC t 1	(27D,116D,49D)	Selects second tray of automatic sheet feed.
ESC x 0	(27D,120D,48D)	Resets NLQ.
ESC x 1	(27D,120D,49D)	Sets NLQ.

F) GRAPHIC PRINTING

The printer can operate in a graphic printing mode according to logic Bit Image Mode (BIM). This convertion enables printing characters by means of dots and horizontal strips (8 dots high). A dot is printed if the corresponding bit received in the Byte is 1.





A printed line can contain both alphanumeric and BIM data. The graphic mode is obtained through the following 4 Escape sequences.

ESC K (n_1) (n_2)	(27D,75D,n_1,n_2)	Sets regular graphic printing mode BIM; n_1 and n_2 indicate the amount of data which follow and must be handled as BIM. n_2 = INTEGER of (number of data/256) n_1 = number of data − n_2 * 256 e.g.: to print 263 data n_2 = INTEGER (263/256) = 1 n_1 = 263-256*1 = 7 The maximum of BIM data to be printed in one line is 480 (950; 1920). If n_1 and n_2 exceed an amount of BIM data higher than 480 (limit), the data in excess is ignored. If in one line alphanumeric characters are also printed, the maximum number of BIM data decreases as shown on table.

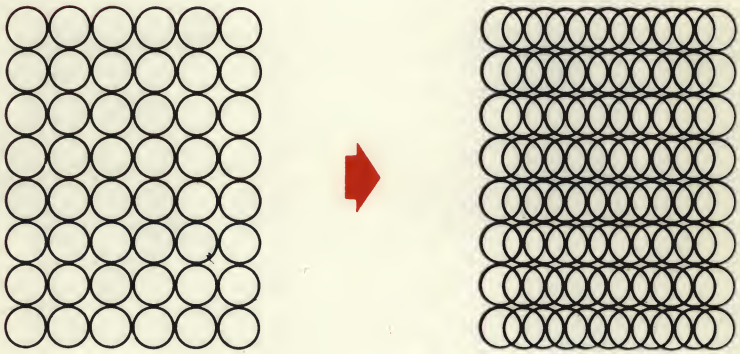
PRINTING RESOLUTION		BIM FOR CHARACTER
Regular	10 char/inch	6
Regular enlarged	5 char/inch	12
Condensed	17.1 char/inch	3.5
Condensed enlarged	8.5 char/inch	7

ESC L (n_1) (n_2) (data)

(27D,76D, (n_1) (n_2)

Selects graphic printing mode BIM with double resolution and halved printing speed. The maximum number of BIM data will double (as well as the BIM values per characters transferred in the previous table).

For other details see instructions ESC K.



ESC Y (n_1) (n_2)	(27D,89D, (n_1) (n_2)	Selects graphic printing mode with double resolution and regular speed. For other details see instruction ESC K.
ESC Z (n_1) (n_2)	(27D,90D, (n_1) (n_2)	Selects graphic printing mode BIM with quadruple resolution. For other details, see ESC K.

As already mentioned, the command codes consist of one or more bytes (characters).

The codes recognised by the printer are grouped according to their functions.

The symbol "n", used in some of the codes, indicates a character whose decimal code is "n".

Index

A. PRINTING TYPES

Italics

ESC 4	27 D, 52 D	Sets Italic printing mode. With IBM character generator selected: sets NLQ.
ESC 5	27 D, 53 D	Clears Italic printing mode. With IBM character generator selected: resets NLQ.

Double Strike

ESC G	27 D, 71 D	Sets Double Strike printing mode, to obtain a more defined character outline.
ESC H	27 D, 72 D	Clears Double Strike printing mode.

Enlarged

SO	14 D	**Shift Out** Sets enlarged (double-width) printing mode. This setting can be cleared using DC4, CAN or at the end of the line (CR or LF) (see also ESC W).
ESC SO	27 D, 14 D	See SO.
DC4	20 D	**Device control 4** Clears enlarged printing mode.
ESC W 1	27 D, 87 D, 49 D	Sets enlarged (double-width) printing mode. As the characters printed have double the normal character width, the line capacity will be halved. This setting remains valid until code ESC W 0 is received.
ESC W 0	27 D, 87 D, 48 D	Clears enlarged printing mode set using code ESC W 1.

Condensed

SI	15 D	**Shift In** Sets condensed printing mode (17.1 char/in). This setting can be cleared be using DC2, CAN or at the end of the line (CR or LF).
ESC SI	27 D, 15 D	See SI.
DC2	18 D	**Device control 2** Clears condensed printing mode.

Underscored

ESC-1	27 D, 45 D, 49 D	Sets underscored printing, and remains valid until code ESC-0 is received.
ESC-0	27 D, 45 D, 48 D	Clears underscored printing set using code ESC-1.

Emphasized

ESC E	27 D, 69 D	Sets emphasized printing mode, and remains valid until code ESC F is received. **Emphasized printing mode halves the printing speed, and if set while condensed printing mode is selected, returns the print pitch to the default value (10 char/in).**
ESC F	27 D, 70 D	Clears emphasized printing mode set using code ESC E.

Elite (12 char/in)

ESC M	27 D, 77 D	Sets printer to operate with Elite characters. This setting remains valid until code ESC P is received.
ESC P	27 D, 80 D	Clears Elite printing setting, and returns printer to Pica printing (10 char/in). This code does not affect Enlarged, Condensed modes, etc.

Proportional Spacing

ESC p 1	27 D, 112 D, 49 D	Sets proportional printing mode. This setting remains valid until code ESC p 0 is received.
ESC p 0	27 D, 112 D, 48 D	Clears proportional printing mode, returning printer to normal pitch.

Select Printing Type

ESC ! (n)	27 D, 33 D ($0 \leq n \leq 63$)	Selects printing type combinations available simultaneously according to the values of parameter "n" given in the following table. **ESC ! (n) has priority over the other print type selection commands (ESC 4, ESC 5, etc.)**

ESC ! "n"

n(dec.)	En	D	Em	C	El
0					
1					o
2					
3					o
4				o	
5					o
6				o	
7					o
8			o		
9					o
10			o		
11					o
12			o		
13					o
14			o		
15					o
16		o			
17		o			o
18		o			
19		o			o
20		o		o	
21		o			o
22		o		o	
23		o			o
24		o	o		
25		o			o
26		o	o		
27		o			o
28		o	o		
29		o			o
30		o	o		
31		o			o

n(dec.)	En	D	Em	C	El
32	o				
33	o				o
34	o				
35	o				o
36	o			o	
37	o				o
38	o			o	
39	o				o
40	o		o		
41	o				o
42	o		o		
43	o				o
44	o		o		
45	o				o
46	o		o		
47	o				o
48	o	o			
49	o	o			o
50	o	o			
51	o	o			o
52	o	o		o	
53	o	o			o
54	o	o		o	
55	o	o			o
56	o	o	o		
57	o	o			o
58	o	o	o		
59	o	o			o
60	o	o	o		
61	o	o			o
62	o	o	o		
63	o	o			o

En = enlarged
D = double strike
Em = emphasized

C = 17.1 char/in (condensed)
El = 12 char/in (Elite)

Superscripts/Subscripts

ESC S 0	27 D, 83 D, 48 D	Sets printing of superscripts (half a line feed above the current print line). This setting remains valid until code ESC T is received.
ESC S 1	27 D, 83 D, 49 D	Sets printing of subscripts (half a line feed below the current print line). This setting remains valid until code ESC T is received.
ESC T	27 D, 84 D	Clears printing of superscripts and subscripts, set by codes ESC S 0 and ESC S 1.

B. LINE FEED VALUES

ESC 0	27 D, 48 D	Sets 1/8 in (3.175 mm) line feed.
ESC 1	27 D, 49 D	Sets 7/72 in (2.47 mm) line feed.
ESC 2	27 D, 50 D	Sets 1/6 in (4.23 mm) line feed.
ESC 3 (n)	27 D, 51 D (0 ≤ n ≤ 255)	Sets n/216 in (0.1176 x n mm) line feed.
ESC A (n)	27 D, 65 D (0 ≤ n ≤ 85)	Sets n/72 in (0.3528 x n mm) line feed.

During initial printer programming, you can set the line feed value at either 1/8 in (ESC 0) or 1/6 in (ESC A (12)).

NOTE: With IBM character generator selected:
ESC 2 : executes ESC A linefeed
ESC A : presets n/72 in linefeed.

C. PAPER FEED

LF	10 D	**Line Feed** Commands printing of characters stored in print buffer and executes one line feed. The line feed value is that programmed using an ESC sequence.
ESC j (n)	27 D, 106 D (0 ≤ n ≤ 36)	**Reverse Line Feed** Commands printing of characters stored in print buffer and executes an n/216 in reverse line feed. Does not affect the line feed value.  **ESC j is not executed if a paper out signal is received.** **ESC j cannot be used if the sprocket is mounted.**
FF	12 D	**Form Feed** Commands printing of characters stored in print buffer and advances the paper to the top of the next form.  **If the automatic sheet feed is mounted, FF causes the expulsion of paper (if any); paper insertion is controlled by the first print command received after FF.**
ESC J (n)	27 D, 74 D (0 ≤ n ≤ 255)	Commands printing of characters stored in print buffer and executes an n/216 in (0.1176 x n) line feed. Does not affect the line feed value (as does ESC 3). With IBM character generator selected : n/216 in line feed + CR.

D. FORMAT CONTROL

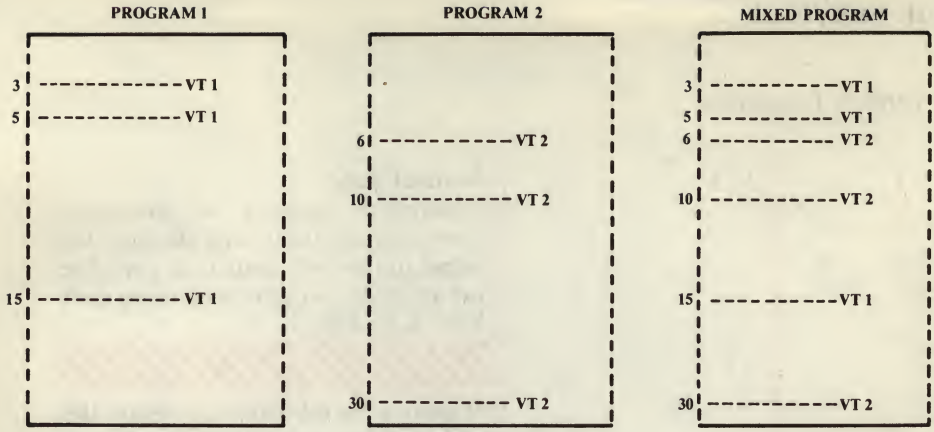
I. HORIZONTAL

HT	9 D	**Horizontal Tab** Prints characters starting from first tabulation stop (tab stops programmed using code ESC D).
ESC D **(n_1, n_2...n_K)** **NUL**	27 D, 68 D, $1 \leq n_1...n_K \leq 79$, using 10 char/in, $1 \leq n_1...n_K \leq 95$, using 12 char/in, $1 \leq n_1...n_K \leq 136$, using 17.1 char/in, $1 \leq K \leq 32$, 0 D	Defines a horizontal tabulation program with a maximum of 32 stops. The decimal values of "n" must be sent in rising numerical order and indicate the column in which the tab stop will be positioned (physical left hand margin is column 1). At printer switch-on, the tab stops are set automatically every 8 characters (default).
ESC Q (n)	27 D, 81 D, "n"	Defines the right hand margin position. Parameter "n" will have one of the following values: 10 char/in $2 \leq n \leq 80$ 12 char/in $3 \leq n \leq 96$ 17.1 char/in $4 \leq n \leq 137$
ESC l (n)	27 D, 108 D, "n"	Defines the left hand margin position. Parameter "n" will have one of the following values: 10 char/in $0 \leq n \leq 78$ 12 char/in $0 \leq n \leq 93$ 17.1 char/in $0 \leq n \leq 134$

II. VERTICAL

Vertical Tabulation

VT	11 D	**Vertical Tab** Commands printing of characters stored in print buffer and advances the paper to the next tabulation stop. The tab stops are programmed using code ESC B or ESC b. **If there is no tabulation program this code has the same function as code LF.**
ESC B **(n_1, n_2...n_K)** **NUL**	27 D, 66 D, $1 \leq n_1 \ldots n_K \leq 254$, $1 \leq K \leq 16$, 0 D	Defines a vertical tabulation program with a maximum of 16 stops. The decimal values of "n" must be sent in rising numerical order and indicate the print line in which the stop will be positioned (Top of Form is line 0).
ESC b (n) **(m_1, m_2...m_K)** **NUL**	27 D, 98 D, $1 \leq n \leq 7$, $1 \leq m_1 \ldots m_K \leq 254$ $1 \leq K \leq 16$, 0 D	Defines a series of vertical tabulation programs (maximum 8), each of which can contain a maximum of 16 tabulation stops. **The tabulation stops programmed using code ESC b 0 are the same as those programmed using code ESC B.**
ESC / (n)	27 D, 47 D ($0 \leq n \leq 7$)	Sets a tabulation program according to the stops programmed using code ESC b in a tabulation program selected by the value of parameter "n".



Form Length

ESC C (n)	27 D, 67 D (1 ≤ n ≤ 127)	Sets form length in number of line feeds (the absolute value of this length depends on the line feed value defined previously).
ESC C NUL (n)	27 D, 67 D, 0 D (1 ≤ n ≤ 22)	Sets form length in inches. The form feeds (FF) executed will be related to this value. You can select a form length of 11 in (279.4 mm) or 12 in (304.8 mm) during the initial printer programming phase.

Definition of Bottom of Form Area

ESC N (n)	27 D, 78 D (1 ≤ n ≤ 127)	Defines, in number of lines, the depth of the bottom of form area in which no printing is allowed; this area will be skipped automatically. **The setting is valid only if the paper is loaded correctly in the top of form (TOF) position.** **If the form length value is changed (ESC C), this code must be retransmitted.** **During the initial printer programming phase, you can define a BOF default value of 0 or 1 in (25.4 mm).**
ESC O	27 D, 79 D	Clears bottom of form area, set by ESC N.

E. NATIONAL CHARACTERS

ESC 7 — 27 D, 55 D

Selects character table 1(see appendix F).

ESC R (n) — 27 D, 82 D ($0 \leq n \leq 8$)

Selects the national character set indicated by the value of parameter "n" (see following table):

n	Nation	n	Nation
0	USA	5	Sweden
1	France	6	Italy
2	Germany	7	Spain
3	Great Britain	8	Japan
4	Denmark		

During the initial printer programming phase, you can select normal or Italic print from table 1 and the national character desired (see chapter: Connection to Computer).

ESC I 1 — 27 D, 73 D, 49 D

Sets the printer to use the characters indicated in the table below.

ESC I 0 — 27 D, 73 D, 48 D

Clears the function set using code ESC I 1.

DECIMAL CODE	CHAR.	DECIMAL CODE	CHAR.	DECIMAL CODE	CHAR.	DECIMAL CODE	CHAR.
0	à	22	¨	128	*à*	150	¨
1	è	23	Ä	129	*è*	151	*Ä*
2	ù	24	Ö	130	*ù*	152	*Ö*
3	ò	25	Ü	131	*ò*	153	*Ü*
4	ì	26	ä	132	*ì*	154	*ä*
5	°	28	ü	133	°	156	*ü*
6	£	29	É	134	£	157	*É*
16	§	30	é	144	§	158	*é*
17	ß	31	¥	145	*ß*	159	¥
21	ø			149	*ø*		

ESC 6	27 D, 54 D	Sets the printing in Italics of the characters indicated in the table below.

DECIMAL CODE	CHAR.	DECIMAL CODE	CHAR.	DECIMAL CODE	CHAR.	DECIMAL CODE	CHAR.
128	à	137	Ñ	145	ß	153	Ü
129	è	136	ñ	146	Æ	154	ä
130	ù	139	o	147	æ	156	ö
131	ò	140	P_t	148	Ø	156	ü
132	ì	141	Á	149	ø	157	É
133	°	142	á	150	¨	158	é
134	£	143	ç	151	Ä	159	¥
135	í	144	§	152	Ö	255	Ø
136	¿						

F. OTHERS

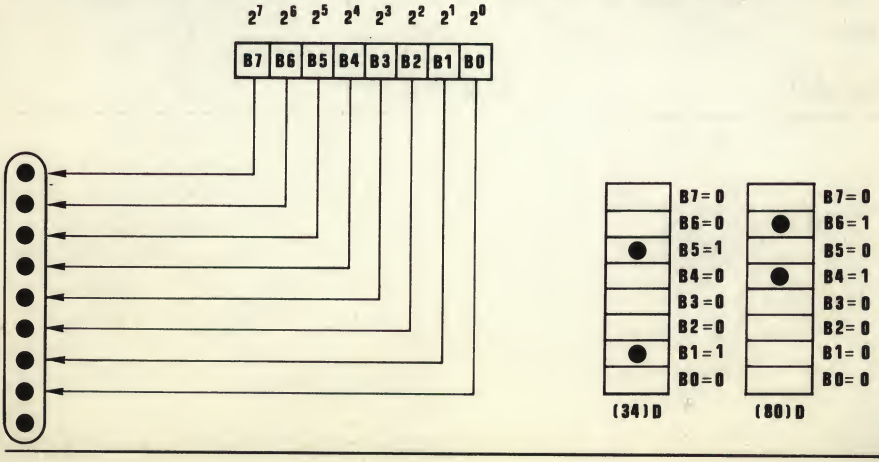
BEL	7 D	**BEL** Activates the printer alarm signal for approximately 1/2 second.
BS	8 D	**Backspace** Commands printing of buffer contents and moves the print head carriage back one character space.
CR	13 D	**Carriage Return** Commands printing of buffer contents and returns the print head to the left hand margin. During initial printer programming phase, you can define the CR = CR + LF feature in which a CR command causes paper to advance one line feed.
DC1	17 D	**Device Control 1** Selects the printer.
DC 3	19 D	**Device Control 3** Deselects the printer.

CAN	24 D	**Cancel** Clears the content of the print buffer (the data is lost). During initial printer programming phase, you can select to ignore this command code.
ESC #	27 D, 35 D	Clears the forcing of the most significant bit (MSB) in 8-bit code to 0 (obtained with ESC =) or to 1 (obtained with ESC >).
ESC =	27 D, 61 D	Sets the most significant bit (2^7) to 0, limiting the code field to 0 D-127 D. See also codes ESC # and ESC >.
ESC >	27 D, 62 D	Sets the most significant bit (2^7) to 1, limiting the code field to 128 D-255 D. See also codes ESC # and ESC =.
ESC @	27 D, 64 D	Initialises the printer, setting it in the same conditions as at switch-on. Clears all the data (texts and settings) in the print buffer.
ESC 8	27 D, 56 D	Disables physical end of form signal. Printing will continue to the last line of the form.
ESC 9	27 D, 57 D	Clears the setting of code ESC 8. Printing will stop at the bottom of form area, and an acoustic signal will be given.
ESC <	27 D, 60 D	Sets the printer to operate monodirectionally (left to right) for one line of print.
ESC U 1	27 D, 85 D, 49 D	Sets monodirectional printing (left to right), to guarantee better alignment of text.
ESC U 0	27 D, 85 D, 48 D	Sets bidirectional printing (faster).

ESC i 1	27 D, 105 D, 49 D	Commands the printing of the character just received, without awaiting a specific print command.
ESC i 0	27 D, 105 D, 48 D	Clears the function set by code ESC i 1, returning to normal printing mode.
ESC s 1	27 D, 115 D, 49 D	Halves the printing speed: the printer operation will be quieter.
ESC s 0	27 D, 115 D, 48 D	Clears the function set by code ESC s 1, returning to normal printing speed.
ESC t 0	27 D, 116 D, 48 D	Selects first tray of automatic sheet feed (default value).
ESC t 1	27 D, 116 D, 49 D	Selects second tray of automatic sheet feed.
ESC x 0	27 D, 120 D, 48 D	Resets NLQ.
ESC x 1	27 D, 120 D, 49 D	Sets NLQ.
DEL	127 D	Clears the last printable character from the print buffer.

G. GRAPHIC PRINTING

The printer can operate in graphic printing mode using Bit Image Mode (BIM) logic. In Bit Image Mode, dots in an eight-dot high vertical format are printed. A dot is printed if the corresponding bit in the byte received is at 1.



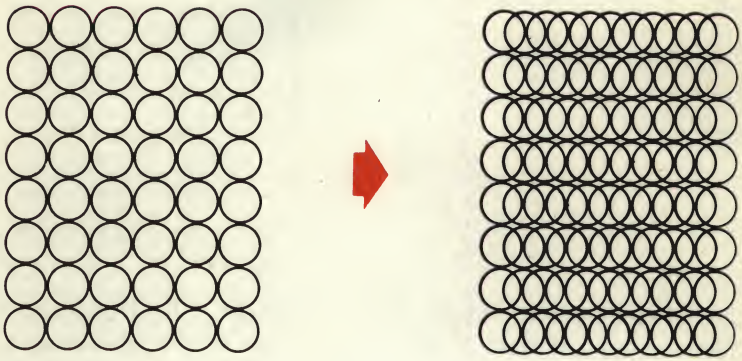
A printed line can contain both alphanumeric and BIM data.

Graphic mode is accessed using the following Escape sequences.

ESC K (n_1) (n_2) (data)	27 D, 75 D, n_1, n_2	Sets normal graphic printing mode. n_1 and n_2 define the amount of data to be handled as BIM data: n_2 = Integer (data/256) n_1 = data n2 x 256 e.g. to print 263 data items n_2 = Integer (263/256) = 1 n_1 = 263-256 x 1 = 7 The maximum amount of BIM data which can be printed on one line is 480 (950, 1920). If n_1 and n_2 give a value which exceeds the corresponding limit, the data in excess is ignored. If the print line also contains alphanumeric data, the amount of BIM data decreases according to the values indicated in the following table

PRINTING PITCH		BIM DATA LOST PER CHARACTER PRINTED
Normal	10 char/in	6
Elite	12 char/in	5
Condensed	17.1 char/in	3.5

ESC L (n_1) (n_2) (data)	27 D, 76 D, (n_1) (n_2)	Selects BIM with double resolution and halved printing speed. The maximum amount of BIM data printable will double, as will the BIM values in the previous table. For further details, see description for code ESC K.



ESC Y (n_1) (n_2) (data)	27 D, 89 D, (n_1) (n_2)	Selects BIM with double resolution and normal printing speed. For further details, see description for code ESC K.
ESC Z (n_1) (n_2) (data)	27 D, 90 D, (n_1) (n_2)	Selects BIM with quadruple resolution. For further details, see description for code ESC K.

ESC * (m) (n_1) (n_2) (data)

27 D, 42 D,
$0 \leq m \leq 6$,
(n_1) (n_2)

Sets graphic printing in the various density and speed combinations indicated by the value of parameter "m" given in the table below:

m	Mode	dot/in
0	Normal density	60
1	Double density, Half speed	120
2	Double density, Normal spd	120
3	Quadruple density	240
4	Graphics display I	80
5	Graphic plotter (X:Y = 1:1)	72
6	Graphics display II	90

For further details, see description for code ESC K.

ESC ? (n) (m)

27 D, 63 D, "n",
$0 \leq m \leq 6$
"n" = K, L, Y or Z
for m, see previous table

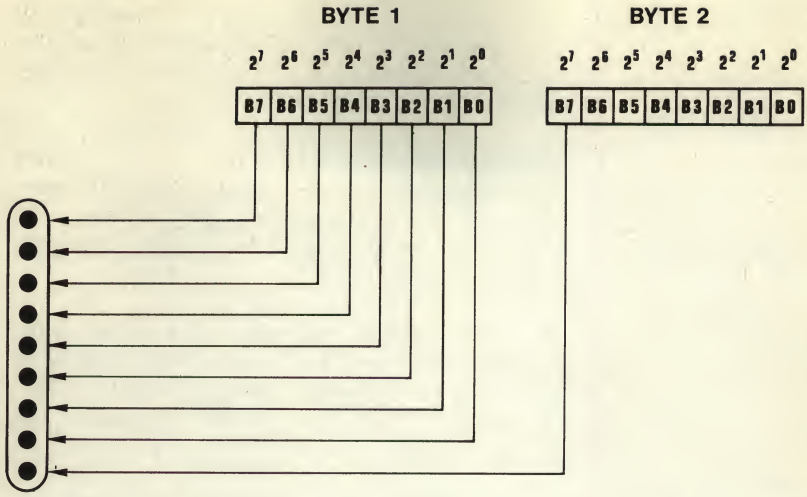
Modifies BIM commands.
In BIM, the printer can operate with 7 different print densities, assigned with codes ESC K, ESC L, ESC Y, ESC Z or ESC * m.
Code ESC ? allows you to vary the BIM density assigned with the codes.
E.g. to modify the density assigned to ESC K from 60 dots/in to 72 dots/in, send the following BASIC sequence:

LPRINT CHR$(27); "?"; "K"; CHR$(5)

ESC ^ (a) (n_1) (n_2) d_{1F}; d_{1S}; d_{2F}; d_{2S}; etc.

27 D, 94 D
a = 0 (60 dots/in)
a = 1 (120 dots/in)
(n_1) (n_2), see ESC K
d_{1F} = 1st byte, 1st string
d_{1S} = 2nd byte, 1st string
d_{2F} = 1st byte, 2nd string
d_{2S} = 2nd byte, 2nd string
etc.

Sets BIM printing (with normal or double density) in 9-dot high horizontal strings, defined in 2 bytes.
This BIM printing mode involves the use of all 9 needles on the print head.



H. DOWN LINE LOADING (DLL) OF USER-DEFINED CHARACTER SET

If you wish, you can define your own character set, and use it instead of the standard set. The characters defined can cover the entire ASCII table (max. 256 characters, indicated by codes 0 D to 255 D). It is also possible to redefine a few characters, keeping the rest standard. The new character set table will be loaded in the printer RAM. Bear in mind that the RAM contents, and therefore any personalised character codes, are lost when the printer is switched off.

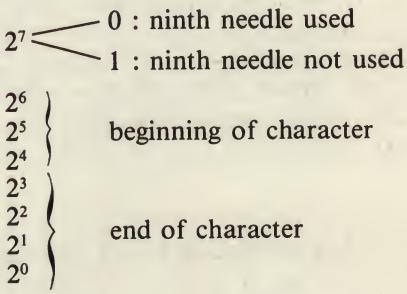
ESC & 0	27 D, 38 D, 48 D	Defines the personalised character codes, loading them in RAM.
(n) (m)	$0 \leq n, m \leq 255$	The meanings of parameters (n), (m) and (a) are given below; parameters P_0, .., P_{10} specify the dot map of the character to be defined (see below).
(a) P_0, P_1, P_2...P_{10}	(a) P_0, P_1, P_2...P_{10}	
(a') P_0', P_1', P_2'..P_{10}'	(a') P_0', P_1', P_2'..P_{10}'	The sequence (a), P_0, .., P_{10} must be repeated for each personalised character.

PARAMETERS (n), (m): define respectively the codes for the beginning and end of the field of characters to be personalised. If "m" = "n", only one character will be personalised.

ATTRIBUTE (a) precedes the eleven bytes P_0, ..., P_{10} which define the character to be personalised. Its meaning will vary, depending on whether the characters being defined has fixed or proportional spacing.

- **Fixed Spacing**: only the value of the most significant bit (2^7) is considered; it must be at 0 if the ninth needle is used (and not the first), and at 1 if the ninth needle is not used (and the first is).

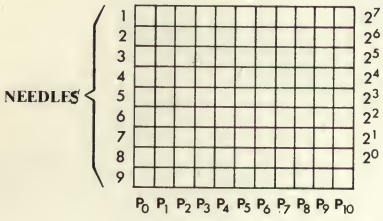
- **Proportional Spacing**: as well as the value of the most significant bit, which will be as described for Fixed Spacing, the values of the other seven bits must also be considered for the definition of the length (variable) of the characters; see below:



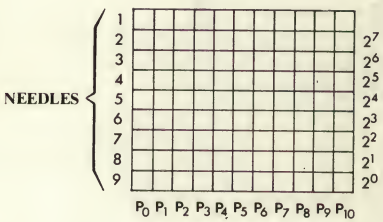
For proportionally spaced characters, therefore, a matrix print area which goes from the beginning to the end of the character is considered, ignoring the bytes which precede the beginning of the character and those which follow it.

PARAMETERS P_0, P_1, .. P_{10}: using the values attributed to these eleven parameters, it is possible to define the shape of the personalised character, by means of the relationship between the character shape and the binary value of parameter P_i.

An 8 x 11 usable matrix is available for the creation of each personalised character:



NINTH NEEDLE NOT USED
(FIRST NEEDLE USED)

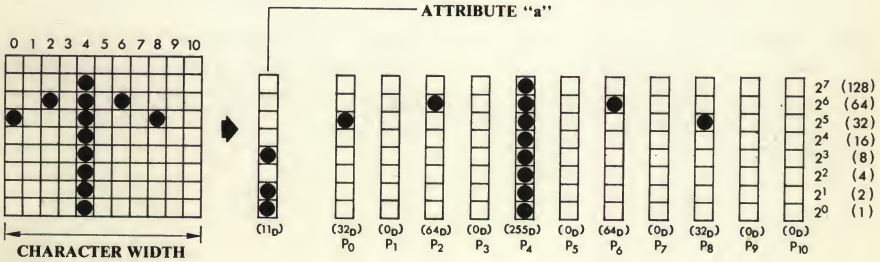


NINTH NEEDLE USED
(FIRST NEEDLE NOT USED)

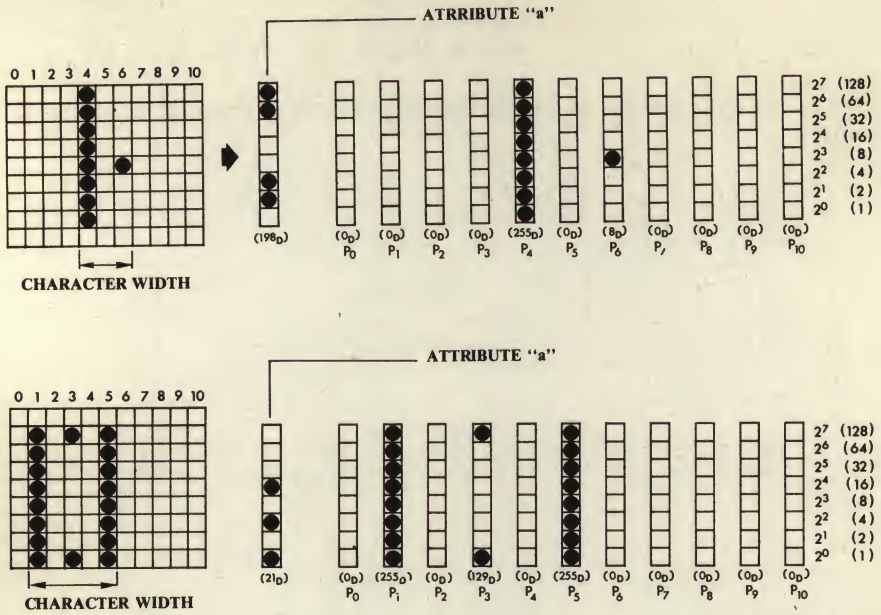
A dot is printed if the corresponding bit in the P-nth byte received is at 1.

Using the 8 x 11 matrix, you can define the dots to be printed to create the character desired. Bear in mind that, to guarantee print needle recycle, a needle used in the nth column cannot be used in column n + 1. Any discrepancy with this limitation will be corrected automatically by the printer. In this case, the character printed will differ from that transmitted.

Example of personalised fixed space character:



Example of personalised proportional space characters:



ESC % 1	27 D, 37 D, 49 D	Selects RAM (user character set defined with code ESC &).
ESC % 0	27 D, 37 D, 48 D	Selects ROM (standard character set, stored permanently in the printer).
ESC : 0 0 0	27 D, 58 D, 48 D, 48 D, 48 D	Copies into RAM, the contents of the ROM character generator (standard characters) in use when the code is received.

A) Technical specifications

Printing technique	Impact dot matrix.
Printing speed	160 char/s Draft mode 35 char/s NLQ-mode.
Printing direction	Bidirectional, shortest path seeking for alphanumeric printing. Monodirectional for graphic printing or when programmed.
Line feed	4.23 mm (1/6 in.); 3.17 mm (1/8 in.); 2.4 mm (7/72 in.); n/216 in.; n/72.
Line feed speed	50 ms.
Paper feed speed	10 cm/s.
Printing characteristics	
Matrix	9 × 9 Draft mode. 18 × 18 NLQ-mode.
Character set	ASCII and special characters (see table, in appendix E).
Print pitch	10 char/in. Draft mode 17.14 char/in. Draft mode.
Graphic BIM mode	• horizontal resolution: 60-120-240 dots/inch • vertical resolution: 72 dots/inch (or inch)

Character size	2.1 mm (L) × 3.1 mm (H), at 10 char/in. 1.1 mm (L) × 3.1 mm (H), at 17.1 char/in. 1.6 mm (H), for super/subscrits.
Length of print line (MAX)	80 characters at 10 char/in. 132 characters at 17.1 char/in. 96 characters at 12 char/in. (EPSON)
Paper handling	Form width — Paper feed
Continuous forms (pin to pin)	98.9-393.7 mm (3.5-15.5in.) — Sprocket.
Paper roll	152.4-279.4 mm (6-14in.) - friction feed.
Single sheets	184.1-279.4 mm (7.25-11in.) - friction feed.
Automatic sheet feed (optional)	4 - 8.5 in (100 - 215.9 mm)- friction Form length: 6 - 14 in (152.5 - 355 mm) Tray capacity: 100 sheets of 80 g/m^2 paper Paper weight: 60 - 100 g/m^2
Copies	1-2 (max thickness 0.3 mm, max weight 180g/m^2).
Paper weight	– single sheet 60-70 g/m^2 – multicopies: original: 45-60 g/m^2 copies (1/2): 40-60 g/m^2 max. (total form): 180 g/m^2
Paper insertion	Rear feed.
Interface	Parallel "standard".
Ribbon	– black reinkable "Dot Cart" cartridge – average life: > 3.000.000 characters.
Operating environment	– temperature: 15°C to 35°C – relative humidity: 15% to 85% (without condensation).
Electrical characteristics	100-115-220-240 V ± 10%; 50-60 Hz Power absorption 350 mA = 70 VA.
Physical characteristics	– height: 100 mm (3.9 in.) – width: 537 mm (21.1 in.) – depth: 295 mm (11.6 in.) – weight: 8.5 kg (18.7 lb).

B) Type of interface

To connect the printer to the C.U., the latter must be equipped with a parallel interface.

All input/output signals are terminated on the printer with a resistance connected to +5 Volt.

Logic 0 is considered as a voltage level between 0 and 0.7V with respect to the logic ground (Pin 33) while logic 1 is a voltage between 2.4 and 5V always with respect to the logic ground.

The printer is equipped with a printing buffer of 1920 characters. The following describes signals, external interface, connector pin assignment and signal source.

Data 1 ÷ 8	from computer	These 8 lines carry the data to be sent to printer.
Strobe	from computer	Negative going pulse signal used to memorize the data in the printer. The pulse duration must be greater than 0.5 microsecs. The polarity of this signal (0 normal, 1 pulse) can be inverted through a jumper on the circuit board.
Busy	from printer	Line normally at 0; at logic level 1 indicates that printer cannot accept any characters and is activated in the following cases; during input character cycle, paper shortage, when printer is in local mode, or error condition.
Ack	from printer	Line normally at 1; goes to 0 for a minimum of 30 microseconds after completed transfer of each character to the printer.
Paper Empty	from printer	Line normally at 0; is set on 1 in case of paper empty condition. This signal is asynchronous with respect to STROBE, BUSY and ACK.

Fault	from printer	Line normally at 1; goes to 0 in case of anomalies like paper empty, printer in "local" mode or printer in fault condition.
Select	from printer	When line is set to 1 it indicates that printer is on. It is enabled by the signal SELECT IN or by dip switch 1 SW7.
Select in	to printer	A logic level 1 of this signal selects the printer if set actively by dip switch 1 SW8.
Auto Feed	to printer	Makes the printer add a line feed for each line closed with CR. May be set active at 1 or at 0 according to the position of the dip switch 1 SW6.
Input Prime	to printer	A logic level 0 maintained for a minimum of 1 microsec resets the printer hardware.
+5 Volt	from printer	+5V level to be used to supply possible circuits to interface the central unit. Maximum current - 350 mA.
Logic ground		Ground reference for logic signals levels and + 5V ground.
Connection to Earth		Pin connected to earth on the mains supply group.

Pin Position

Signal Pin. N.	Return Pin. N.	Signal
1	19	Strobe
2	20	Data 1
3	21	Data 2
4	22	Data 3
5	23	Data 4
6	24	Data 5
7	25	Data 6
8	26	Data 7
9	27	Data 8
10	28	ACK
11	29	Busy
12	30	Paper EMPTY
13		Select
14		AUTO FEED
15		NC
16		OV
17		Connection to earth
18		+5 V
19-30		Logic ground
31		INPUT PRIME
32		FAULT
33		OV
34		NC
35		+5 V

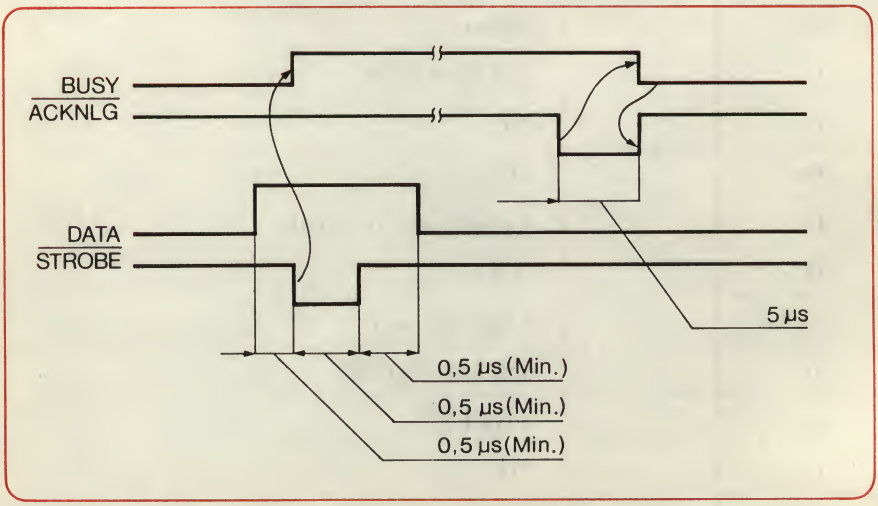
Printer Connection Cable

The cable connecting the connector of the printer and the connector of the host computer must be made of 36 wires; a common multiwire cable can be used for cables shorter that one metre; for longer ones we recommend a twisted-pair cable; never use a cable longer than three metres.

For the connection to the host computer, follow the directions described in the relevant chapter.

The connector to the printer may be of the following types:
AMP
Amphenol
or Thomas and Bett

Sequence and timing of data transfer



C) Printing style combinations (IBM)

n	N	NLQ	Em	En	Sp	Sb	C
1	●						
2				●			
3		●					
4		●		●			
5					●		
6				●	●		
7						●	
8				●		●	
9			●				
10			●	●			
11			●		●		
12			●	●	●		
13			●			●	
14			●	●		●	
15							●
16				●			●
17					●		●
18				●	●		●
19							●
20				●		●	●

N = Normal
NLQ = Near Letter Quality
Em = Emphasized
En = Enlarged
Sp = Superscripts
Sb = Subscripts
C = Condensed (17.1 char/inch)

D) Examples of alphanumeric printing

Draft + Enlarged mode :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890

Condensed + Enlarged mode :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Emphasized + Enlarged mode :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890

Near Letter Quality + Enlarged mode :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890

Subscript + Enlarged mode :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890

Superscript + Enlarged mode :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890

Condensed + Subscript + Enlarged mode :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890

Condensed + Superscript + Enlarged mode :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890

Emphasized + Subscript + Enlarged mode :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890

Emphasized + Superscript + Enlarged mode :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890

Draft mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Condensed mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Emphasized mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Near Letter Quality mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Subscript mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Superscript mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Condensed + Subscript mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Condensed + Superscript mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Emphasized + Subscript mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Emphasized + Superscript mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Draft + Underlined mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Condensed + Underlined mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Emphasized + Underlined mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Near Letter Quality + Underlined mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Subscript + Underlined mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Superscript + Underlined mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Condensed + Subscript + Underlined mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Condensed + Superscript + Underlined mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Emphasized + Subscript + Underlined mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

Emphasized + Superscript + Underlined mode :
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 abcdefghijklmnopqrstuvwxyz

A printer for professional PC's:

The printer is an 8 inch dot matrix printer.

The printing speed of 160 c.p.s. and the matrix of 9x9 dots allows high throughput and professional quality for invoices, listings, tables, etc.

friendly

* Three way paper handling:
  - Friction
  - Pin Feed
  - Adjustable Tractor

* Easy throw-away cartridge for ribbon with up to 3 million character life

* Twin Interface available as option (Parallel and Serial)

* Silent Printing (less than 58 dBA)

& compatible

* Draft printing for your reports in a 9x9 matrix at 10 or 17 pitch

* **Emphasized or Near Letter Quality printing in two pass mode for your W.P. applications**

* **Double size** and Bold Face printing for titles

* Micro Printing for notes, ^{super} and $_{sub}$-script useful for:

  - formulae : $\int_a^b f(x)\,dx$

  - scientific reports : $K = 2\,sen^2\alpha + \cos^2\beta$

    $R_1 + R_2 + R_3 = 2.2\ k\Omega$

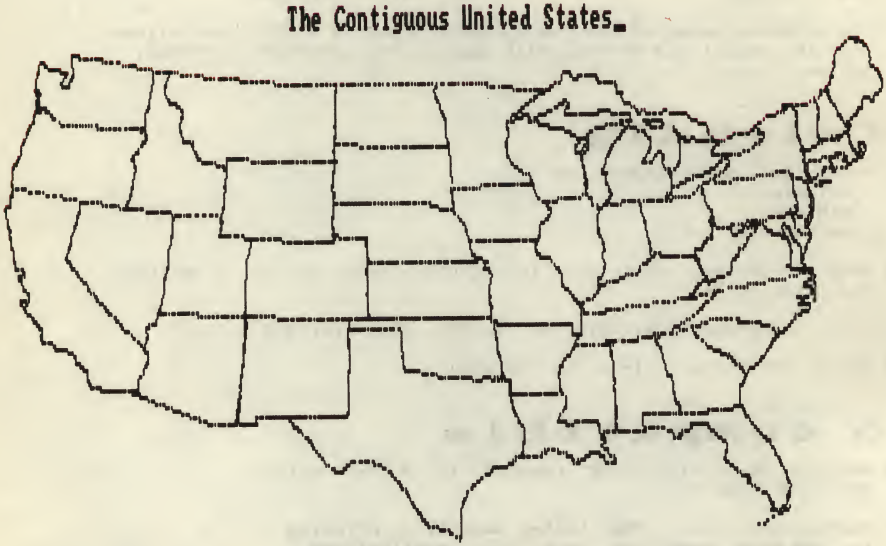
* Graphic Symbols: ▓▒▌┤┼┐┘└┴┬├─┼┌▄▛

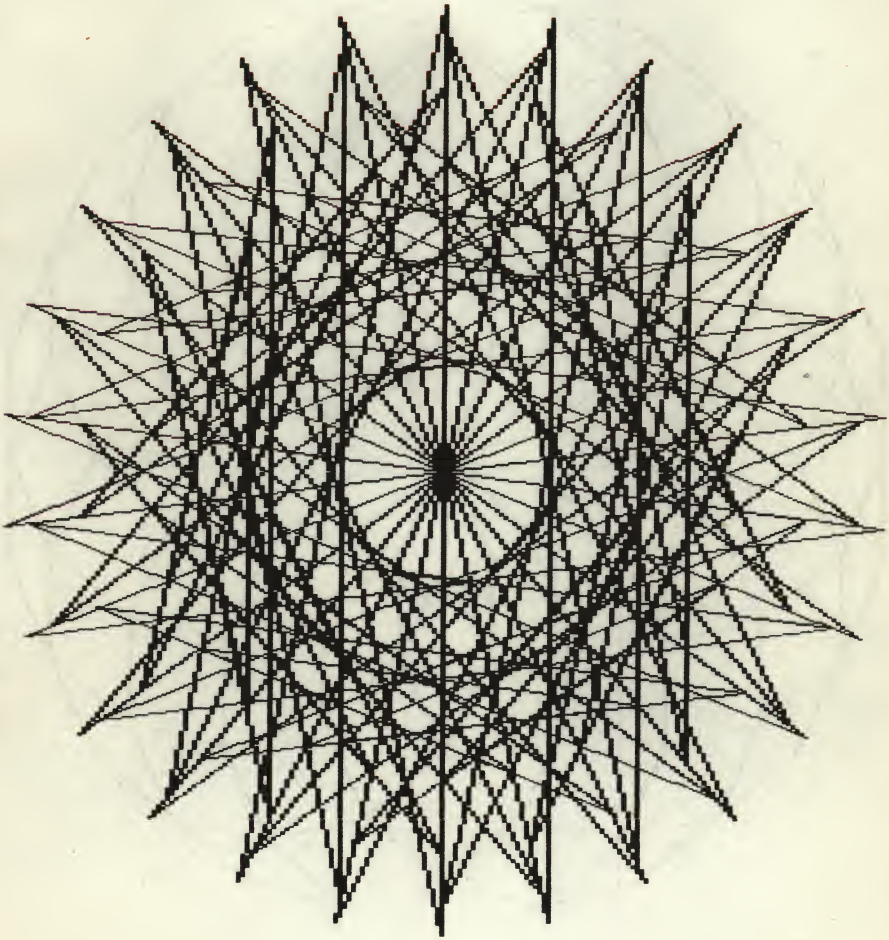
* Scientific Symbols: ª²³¬½¼«»αßΓπΣσµτΦΘΩδ∞ØϵΠ≡±≥≤⌠⌡÷≈°∙·√ⁿ²■

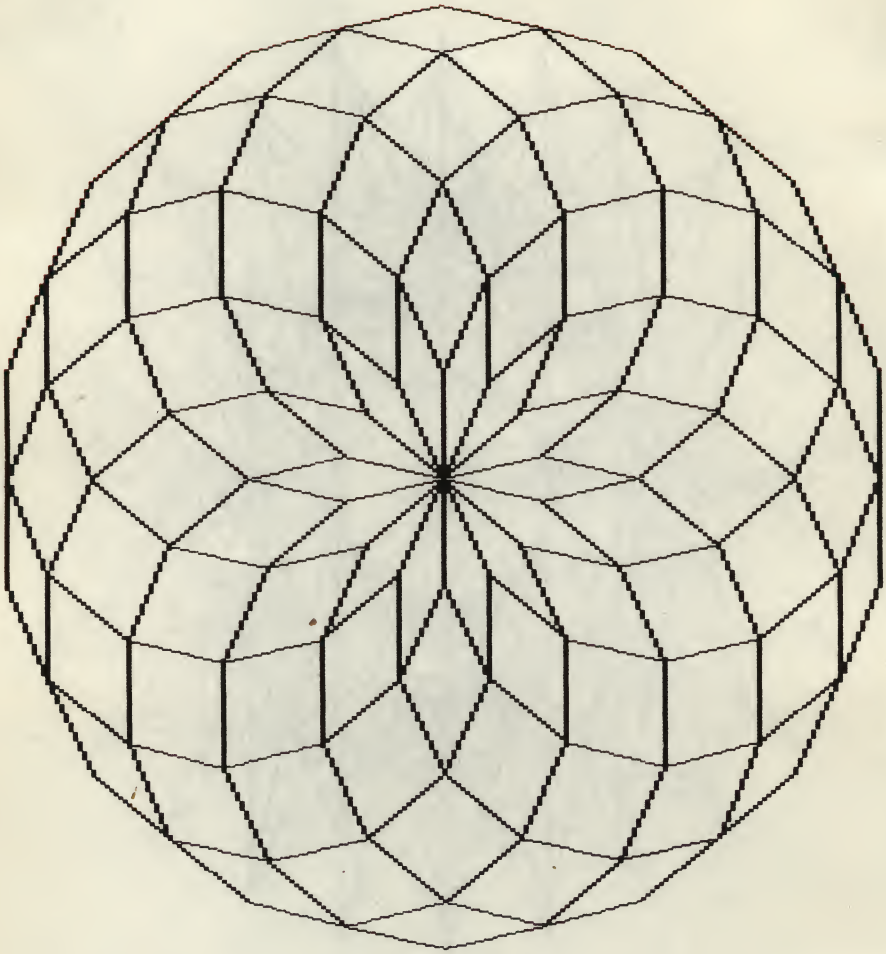
* National Characters: ÇüéâäàåçêëèïîìÄÅÉæÆôöòûùÿÖÜ¢£¥₧ƒáíóúñÑ¿¡

* **Graphic Capabilities: 60 / 120 / 240 d.p.i.**

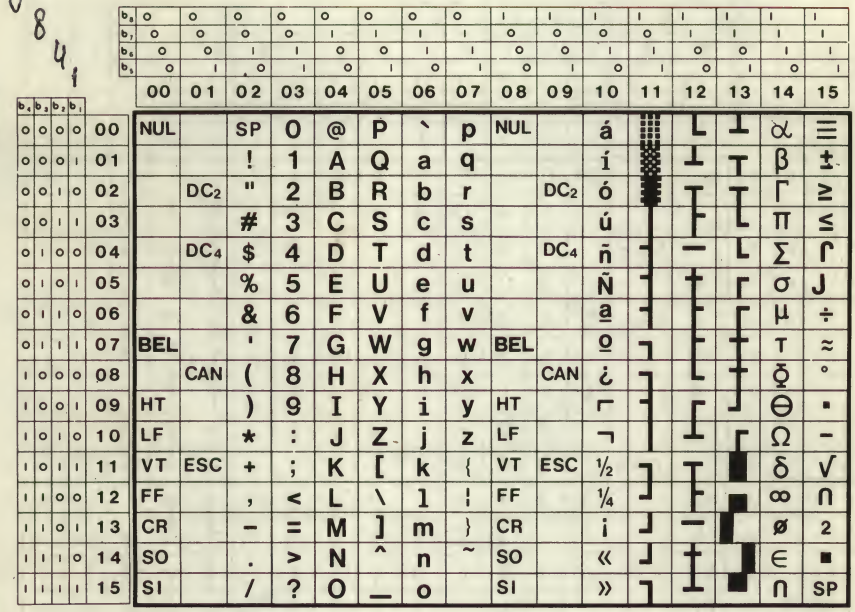
* **Industry Standard Interface for compatibility with the commercial software packages.**


The Contiguous United States_





IBM Environment

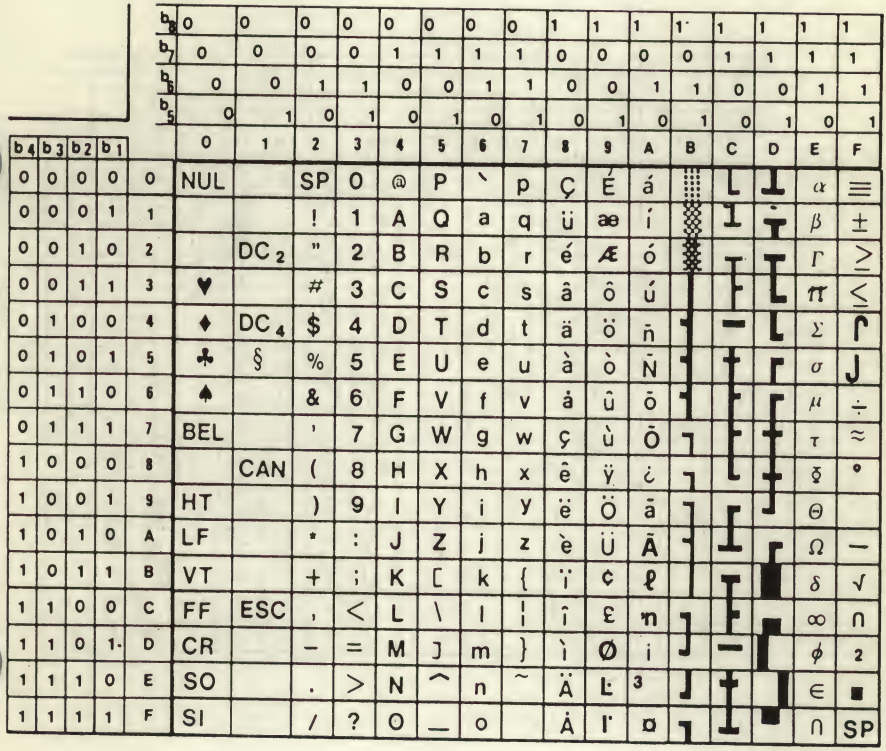


b_4 b_3 b_2 b_1	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
0 0 0 0	NUL		SP	0	@	P	`	p	NUL		á				α	≡
0 0 0 1			!	1	A	Q	a	q			í				β	±
0 0 1 0		DC_2	"	2	B	R	b	r		DC_2	ó				Γ	≥
0 0 1 1			#	3	C	S	c	s			ú				π	≤
0 1 0 0		DC_4	$	4	D	T	d	t		DC_4	ñ				Σ	⌠
0 1 0 1			%	5	E	U	e	u			Ñ				σ	J
0 1 1 0			&	6	F	V	f	v			ª				μ	÷
0 1 1 1	BEL		'	7	G	W	g	w	BEL		º				τ	≈
1 0 0 0		CAN	(	8	H	X	h	x		CAN	¿				Φ	°
1 0 0 1	HT		)	9	I	Y	i	y	HT		⌐				Θ	∙
1 0 1 0	LF		*	:	J	Z	j	z	LF		¬				Ω	–
1 0 1 1	VT	ESC	+	;	K	[	k	{	VT	ESC	½				δ	√
1 1 0 0	FF		,	<	L	\	l	¦	FF		¼				∞	n
1 1 0 1	CR		–	=	M	]	m	}	CR		¡				ø	2
1 1 1 0	SO		.	>	N	^	n	~	SO		«				∈	■
1 1 1 1	SI		/	?	O	_	o		SI		»				n	SP

Tab. 1 ESC 7 INTERNATIONAL (IBM 1)

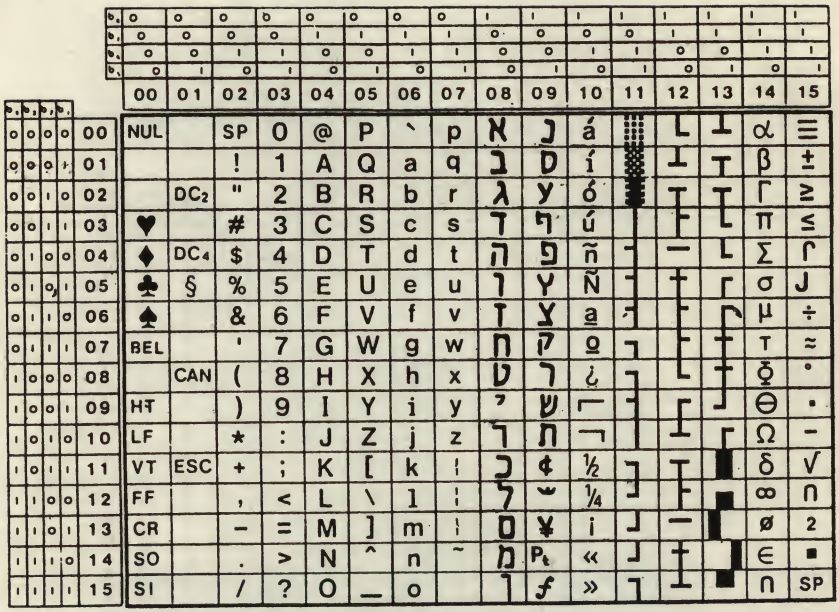
b4	b3	b2	b1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0	NUL		SP	0	@	P	`	p	Ç	É	á	▒	└	┴	α	≡
0	0	0	1	1			!	1	A	Q	a	q	ü	æ	í	▒	┴	┬	β	±
0	0	1	0	2		DC2	"	2	B	R	b	r	é	Æ	ó	▒	┬	├	Γ	≥
0	0	1	1	3	♥		#	3	C	S	c	s	â	ô	ú		├	─	π	≤
0	1	0	0	4	♦	DC4	$	4	D	T	d	t	ä	ö	ñ	┤	─	┼	Σ	⌠
0	1	0	1	5	♣	§	%	5	E	U	e	u	à	ò	Ñ	┤	┼	┤	σ	⌡
0	1	1	0	6	♠		&	6	F	V	f	v	ª	û	a	┤	┤	┤	µ	÷
0	1	1	1	7	BEL		'	7	G	W	g	w	ç	ù	º	┐	┤	┤	τ	≈
1	0	0	0	8		CAN	(	8	H	X	h	x	ê	ÿ	¿	┐	└	┤	Φ	°
1	0	0	1	9	HT		)	9	I	Y	i	y	ë	Ö	⌐	┐	┬	┘	Θ	∙
1	0	1	0	A	LF		*	:	J	Z	j	z	è	Ü	¬	┤	┴	┌	Ω	─
1	0	1	1	B	VT	ESC	+	;	K	[	k	{	ï	¢	½	┤	├	▀	δ	√
1	1	0	0	C	FF		,	<	L	\	l	¦	î	£	¼	┘	┼	▄	∞	n
1	1	0	1	D	CR		-	=	M	]	m	}	ì	¥	i	┘	─	▌	φ	2
1	1	1	0	E	SO		.	>	N	^	n	~	Ä	₧	«	┘	┼	▐	∈	■
1	1	1	1	F	SI		/	?	O	_	o		Å	ƒ	»	┐	┴	▄	∩	SP

Tab. 2 ESC 6 INTERNATIONAL (IBM 2)



b4 b3 b2 b1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0 0 0 0	NUL		SP	0	@	P	`	p	Ç	É	á				α	≡
0 0 0 1			!	1	A	Q	a	q	ü	æ	í				β	±
0 0 1 0		DC2	"	2	B	R	b	r	é	Æ	ó				Γ	≥
0 0 1 1	♥		#	3	C	S	c	s	â	ô	ú				π	≤
0 1 0 0	♦	DC4	$	4	D	T	d	t	ä	ö	ñ				Σ	⌠
0 1 0 1	♣	§	%	5	E	U	e	u	à	ò	Ñ				σ	⌡
0 1 1 0	♠		&	6	F	V	f	v	å	û	õ				μ	÷
0 1 1 1	BEL		'	7	G	W	g	w	ç	ù	Õ				τ	≈
1 0 0 0		CAN	(	8	H	X	h	x	ê	ÿ	¿				ϱ	°
1 0 0 1	HT		)	9	I	Y	i	y	ë	Ö	ã				Θ	
1 0 1 0	LF		*	:	J	Z	j	z	è	Ü	Ã				Ω	—
1 0 1 1	VT		+	;	K	[	k	{	ï	¢	₧				δ	√
1 1 0 0	FF	ESC	,	<	L	\	l	¦	î	£	ⁿ				∞	∩
1 1 0 1	CR		-	=	M	]	m	}	ì	Ø	i				ϕ	²
1 1 1 0	SO		.	>	N	^	n	~	Ä	Ł	³				∈	■
1 1 1 1	SI		/	?	O	_	o		Å	ł	¤				∩	SP

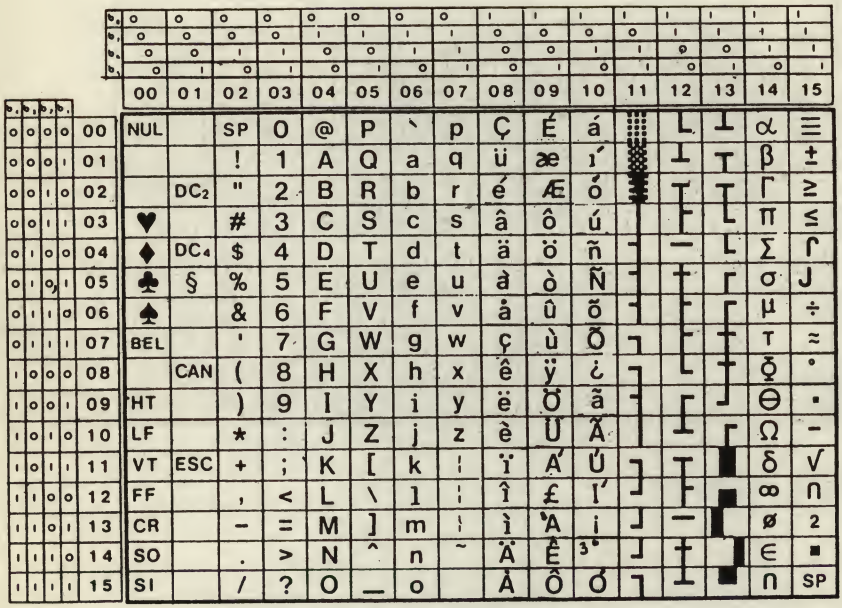
Tab. 3 ESC 6 - DENMARK



Tab. 4 ESC 6 - ISRAEL

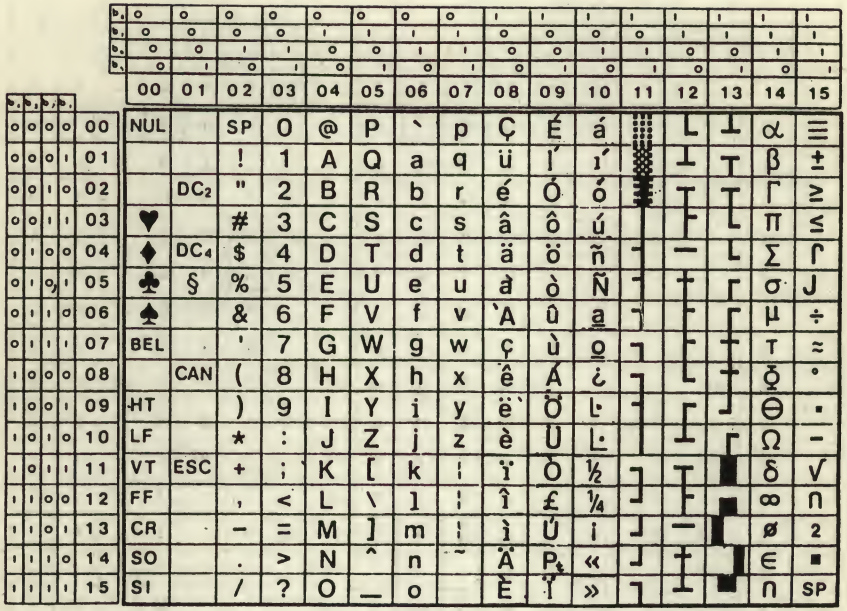
b7 b6 b5 b4	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
0 0 0 0	00	NUL		SP	0	@	P	`	p	A	P	I				ω	΄Ω
0 0 0 1	01			!	1	A	Q	a	q	Β	Σ	Κ				ά	±
0 0 1 0	02		DC_2	"	2	B	R	b	r	Γ	Τ	Λ				έ	≥
0 0 1 1	03	♥		#	3	C	S	c	s	Δ	Υ	μ				ή	≤
0 1 0 0	04	♦	DC_4	$	4	D	T	d	t	Ε	Φ	ν				ϊ	Γ
0 1 0 1	05	♣	§	%	5	E	U	e	u	Ζ	Χ	ξ				ί	J
0 1 1 0	06	♠		&	6	F	V	f	v	Η	Ψ	ο				ό	÷
0 1 1 1	07	BEL		'	7	G	W	g	w	Θ	Ω	π				ύ	≈
1 0 0 0	08		CAN	(	8	H	X	h	x	Ι	α	ρ				ϋ	°
1 0 0 1	09	HT		)	9	I	Y	i	y	Κ	β	σ				ώ	£
1 0 1 0	10	LF		*	:	J	Z	j	z	Λ	Υ	ς				Ά	–
1 0 1 1	11	VT	ESC	+	;	K	[	k	{	Μ	δ	Τ				Έ	√
1 1 0 0	12	FF		,	<	L	\	l	¦	Ν	ε	υ				Ή	∩
1 1 0 1	13	CR		–	=	M	]	m	}	Ξ	ζ	φ				Ί	2
1 1 1 0	14	SO		.	>	N	^	n	~	Ο	η	χ				Ό	■
1 1 1 1	15	SI		/	?	O	_	o		Π	θ	ψ				Ύ	SP

Tab. 5 ESC 6 - GREECE



	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
00	NUL		SP	0	@	P	`	p	Ç	É	á	▒	└	┴	α	≡
01			!	1	A	Q	a	q	ü	æ	í	▒	┴	┬	β	±
02		DC_2	"	2	B	R	b	r	é	Æ	ó	▒	┬	┌	Γ	≥
03	♥		#	3	C	S	c	s	â	ô	ú	▒	├	└	π	≤
04	♦	DC_4	$	4	D	T	d	t	ä	ö	ñ	┤	─	└	Σ	⌠
05	♣	§	%	5	E	U	e	u	à	ò	Ñ	┤	┼	┌	σ	J
06	♠		&	6	F	V	f	v	å	û	õ	┤	├	┌	μ	÷
07	BEL		'	7	G	W	g	w	ç	ù	Õ	┐	├	┼	τ	≈
08		CAN	(	8	H	X	h	x	ê	ÿ	¿	┐	└	┼	Φ	°
09	HT		)	9	I	Y	i	y	ë	Ö	ã	┤	┌	┘	Θ	∙
10	LF		*	:	J	Z	j	z	è	Ü	Ã	│	┴	┌	Ω	·
11	VT	ESC	+	;	K	[	k	¦	ï	á	ú	┐	┬	▉	δ	√
12	FF		,	<	L	\	l	¦	î	£	í	┘	├	▉	∞	n
13	CR		−	=	M	]	m	¦	ì	Á	¡	┘	─	▉	ø	2
14	SO		.	>	N	^	n	~	Ä	É	3°	┘	┼	▉	∈	■
15	SI		/	?	O	_	o		Å	Ô	Ó	┐	┴	▉	∩	SP

Tab. 6 ESC 6 - PORTUGAL



	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
0000	00	NUL		SP	0	@	P	`	p	Ç	É	á					
0001	01			!	1	A	Q	a	q	ü	Í	ı					
0010	02		DC_2	"	2	B	R	b	r	é	Ó	ó					
0011	03	♥		#	3	C	S	c	s	â	ô	ú					
0100	04	♦	DC_4	$	4	D	T	d	t	ä	ö	ñ					
0101	05	♣	§	%	5	E	U	e	u	à	ò	Ñ					
0110	06	♠		&	6	F	V	f	v	Á	û	ª					
0111	07	BEL		'	7	G	W	g	w	ç	ù	º					
1000	08		CAN	(	8	H	X	h	x	ê	Á	¿					
1001	09	HT		)	9	I	Y	i	y	ë	Ö	⌐					
1010	10	LF		*	:	J	Z	j	z	è	Ü	¬					
1011	11	VT	ESC	+	;	K	[	k	¡	ï	Ò	½					
1100	12	FF		,	<	L	\	l	¡	î	£	¼					
1101	13	CR		−	=	M	]	m	¡	ì	Ú	¡					
1110	14	SO		.	>	N	^	n	~	Ä	₧	«					
1111	15	SI		/	?	O	_	o		È	¯	»					

Tab. 7 ESC 6 - SPAIN

b_4 b_3 b_2 b_1		b_8 0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
		b_7 0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
		b_6 0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
		b_5 0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0 0 0 0	0			SP	0	@	P	`	p			SP	0	@	P	`	p
0 0 0 1	1		DC_1	!	1	A	Q	a	q		DC_1	!	1	A	Q	a	q
0 0 1 0	2		DC_2	"	2	B	R	b	r		DC_2	"	2	B	R	b	r
0 0 1 1	3		DC_3	#	3	C	S	c	s		DC_3	#	3	C	S	c	s
0 1 0 0	4		DC_4	$	4	D	T	d	t		DC_4	$	4	D	T	d	t
0 1 0 1	5			%	5	E	U	e	u			%	5	E	U	e	u
0 1 1 0	6			&	6	F	V	f	v			&	6	F	V	f	v
0 1 1 1	7	BEL		'	7	G	W	g	w	BEL		'	7	G	W	g	w
1 0 0 0	8	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x
1 0 0 1	9	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y
1 0 1 0	A	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z
1 0 1 1	B	VT	ESC	+	;	K	[	k	{	VT	ESC	+	;	K	[	k	{
1 1 0 0	C	FF		,	<	L	/	l	¦	FF		,	<	L	\	l	¦
1 1 0 1	D	CR		-	=	M	]	m	}	CR		-	=	M	]	m	}
1 1 1 0	E	SO		.	>	N	^	n	~	SO		.	>	N	^	n	~
1 1 1 1	F	SI		/	?	O	—	o	DEL	SI		/	?	O	—	o	DEL

National variants

Tab. 1 Basic Character Set - ESC 7

NATIONAL VARIANTS:												
NATIONS	HEX. CODE											
	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
U.S.A.	#	$	@	[	\	]	¨	`	{	¦	}	~
FRANCE	#	$	à	°	ç	§	^	`	é	ù	è	¨
GERMANY	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
G. BRITAIN	£	$	@	[	\	]	^	`	{	¦	}	~
DENMARK 1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
SWEDEN	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
ITALY	#	$	@	°	\	é	^	ù	à	ò	è	ì
SPAIN	Pt	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
JAPAN	#	$	@	[	¥	]	^	`	{	¦	}	~

Tab. 2 National Variants - ESC R

F) Troubleshooting Guide

Due to the highly sophisticated nature of the circuitry and mechanismd used in the printer, operator intervention is limited to certain easily identified symptoms and remedies.
If a printer malfunction other than those indicated below occurs, the operator should contact the After Sales Service or the dealer from whom the printer was purchased.

Problem	Possible Cause	Corrective Action
Does not print. ON light is off.	Power OFF.	Plug into an efficient A.C. socket and switch on printer.
Does not print. One or more indicators ON.	Autodiagnostic error.	Switch printer OFF then ON again. If indicators are still ON, call Service Technician.
Does not print. Print head carriage blocked, with acoustic singal.	Fault.	Check that print head carriage is free to move. Switch printer OFF then ON again. If error persists, call Service Technician.
Does not print. PAPER EMPTY indicator ON, with acoustic signal.	Paper out.	Insert more paper. Press LOCAL key.

Printing does not start at top of page.	Incorrect programming of form length. Incorrect positioning of top of form.	Program form length correctly. Position form correctly and press Form Feed key.
Document tearing or skewing.	Document not aligned correctly.	Insert and align document correctly.
Incomplete or faded printing.	Incorrect position of print intensity (head-platen distance) lever. Ribbon cartridge not inserted correctly or needs replacing.	Position lever according to number of copies to be printed. Insert correctly or replace cartridge.

IBM Environment

Code			Description	Ref. page
ASCII	DEC.	HEX		
NUL	0	00	Used with ESC D as list closure code.	6.7
BEL	7	07	Acoustic signal.	6.8
HT	9	09	Horizontal tabulation program.	6.7
LF	10	0A	Paper advances one feed line.	6.6
VT	11	0B	Paper advances one feed line.	6.7
FF	12	0C	Form feed.	6.6
CR	13	0D	Carriage return (printing command).	6.8
SO	14	0E	Sets enlarged printing mode.	6.4
SI	15	0F	Sets 17.1 char/in. (Draft mode). Is ignored when NLQ mode is on.	6.4
DC2	18	12	Clears 17.1 char/in. (Draft). Is ignored when NLQ mode is on.	6.4
DC4	20	14	Clears enlarged printing mode.	6.4
CAN	24	18	Clears printing buffer memory.	6.8

Code			Description	Ref. page
ASCII	DEC.	HEX		
ESC-0	27 45 48	1B 2D 30	Clears underscoring.	6.5
ESC-1	27 45 49	1B 2D 31	Sets underscoring.	6.5
ESC 0	27 48	1B 30	Sets line feed value: 1/8 in. (3.175 mm).	6.6
ESC 1	27 49	1B 31	Sets line feed value: 7/72 in. (2.47 mm).	6.6
ESC 2	27 50	1B 32	Sets line feed value: 1/6 in. (4.23 mm).	6.6
ESC 3	27 51	1B 33	Sets line feed value: n/216 in. (n × 0,1176 mm).	6.6
ESC 6	27 54	1B 36	Selects table 2 of character set.	6.8
ESC 7	27 55	1B 37	Selects table 1 of character set.	6.9
ESC 8	27 56	1B 38	Disactivates paper out signal.	6.9
ESC 9	27 57	1B 39	Activates paper out signal.	6.9
ESC <	27 60	1B 3C	Carriage returns to left margin.	6.9
ESC A	27 65	1B 41	Sets line feed value: n/72 in. (n × 0,3528 mm); activated by ESC 2.	6.6
ESC C	27 67	1B 43	Sets form length in number of line feeds.	6.7

ESC D	27 68	1B 44	Sets horizontal tabulation program.	6.7
ESC E	27 69	1B 45	Sets emphasized printing mode. Is ignored when NLQ is on.	6.5
ESC F	27 70	1B 46	Clears emphasized printing mode. Is ignored when NLQ is on.	6.5
ESC G	27 71	1B 47	Sets NLQ mode.	6.3
ESC H	27 72	1B 48	Clears NLQ mode. Sets normal mode (Draft).	6.3
ESC J	27 74	1B 4A	Commands printing buffer and advances paper by n/216''.	6.9
ESC K	27 75	1B 4B	Sets regular graphic printing mode.	6.10
ESC L	27 76	1B 4C	Sets graphic printing mode with double density, halved speed.	6.11
ESC N	27 78	1B 4E	Presets lower margin (BOF) in number of lines.	6.8
ESC O	27 79	1B 4F	Clears BOF.	6.8
ESC S 0	27 83 48	1B 53 30	Sets printing of superscripts.	6.5
ESC S 1	27 83 49	1B 53 31	Sets printing of subscripts.	6.5
ESC T	27 84	1B 54	Clears super/subscripts.	6.5

ESC U 0	27 85 48	1B 55 30	Sets bidirectional printing.	6.9
ESC U 1	27 85 49	1B 55 31	Sets monodirectional printing.	6.9
ESC W 0	27 87 48	1B 57 30	Clears enlarged printing mode.	6.1
ESC W 1	27 87 49	1B 57 31	Sets enlarged printing mode.	6.1
ESC Y	27 89	1B 59	Sets graphic printing mode with double density, regular speed.	6.11
ESC Z	27 90	1B 5A	Selects graphic printing mode with quadruple density.	6.11
ESC t 0	27 116 48	1B 74 30	Selects first tray of automatic sheet feed (default value).	6.9
ESC t 1	27 116 49	1B 74 31	Selects second tray of automatic sheet feed.	6.9
ESC x 0	27 120 48	1B 79 30	Resets NLQ.	6.9
ESC x 1	27 120 49	1B 79 31	Sets NLQ.	6.9

Code			Description	Page
ASCII	Decimal	Hexadec.		
NUL	0	00	Used with ESC B, ESC b, ESC D as list closure code.	6.20 6.21
BEL	7	07	Acoustic signal.	6.25
BS	8	08	Backspace (printing command).	6.25
HT	9	09	Horizontal tabulation command.	6.20
LF	10	0A	Advances paper one line feed.	6.19
VT	11	0B	Advances paper to next tabulation stop.	6.21
FF	12	0C	Advances paper to top of next form.	6.19
CR	13	0D	Carriage return (printing command).	6.25
SO	14	0E	Sets enlarged (double-width) printing mode.	6.14
SI	15	0F	Sets condensed printing mode (17.1 char/in).	6.14
DC1	17	11	Selects the printer.	6.25
DC2	18	12	Clears condensed printing mode.	6.14
DC 3	19	13	Deselects the printer.	6.25
DC4	20	14	Clears enlarged printing mode.	6.14
CAN	24	18	Clears contents of print buffer.	6.26

Code			Description	Page
ASCII	Decimal	Hexadec.		
ESC SO	27 14	1B 0E	See SO.	6.14
ESC SI	27 15	1B 0F	See SI.	6.14
ESC !	27 33	1B 21	Selects printing type combinations.	6.16
ESC #	27 35	1B 23	Clears forcing of bit 2^7 (MSB).	6.26
ESC % 0	27 37 48	1B 25 30	Selects standard character generator (ROM).	6.34
ESC % 1	27 37 49	1B 25 31	Selects user character set generator (RAM).	6.34
ESC &	27 38	1B 26	Defines user character codes, loading them in RAM.	6.31
ESC *	27 42	1B 2A	Sets graphic printing in various densities.	6.30
ESC-0	27 45 48	1B 2D 30	Clears underscored printing.	6.15
ESC-1	27 45 49	1B 2D 31	Sets underscored printing.	6.15
ESC /	27 47	1B 2F	Selects a vertical tabulation program.	6.21
ESC 0	27 48	1B 30	Sets 1/8 in (3.175 mm) line feed.	6.18
ESC 1	27 49	1B 31	Sets 7/72 in (2.47 mm) line feed.	6.18
ESC 2	27 50	1B 32	Sets 1/6 in (4.23 mm) line feed.	6.18
ESC 3	27 51	1B 33	Sets n/216 in (0.1176 x n mm) line feed.	6.18
ESC 4	27 52	1B 34	Sets Italic printing mode.	6.13
ESC 5	27 53	1B 35	Clears Italic printing mode.	6.13
ESC 6	27 54	1B 36	Expands printable characters.	6.25

ESC 7	27 55	1B 37	Selects table 1 of characters.	6.24
ESC 8	27 56	1B 38	Disables end of paper signal.	6.26
ESC 9	27 57	1B 39	Enables end of paper signal.	6.26
ESC :	27 58	1B 31	Copies standard character generator (ROM) into RAM.	6.34
ESC <	27 60	1B 3C	Returns print head to left hand margin.	6.26
ESC =	27 61	1B 3D	Sets most significant bit (2^7) to 0 (MSB).	6.26
ESC >	27 62	1B 3E	Sets most significant bit (2^7) to 1 (MSB).	6.26
ESC ?	27 63	1B 3F	Modifies density assigned with BIM command codes.	6.30
ESC @	27 64	1B 40	Initialises the printer (general reset).	6.26
ESC A	27 65	1B 41	Sets n/72 in (0.3528 x n mm) line feed.	6.18
ESC B	27 66	1B 42	Defines a vertical tabulation program.	6.21
ESC C	27 67	1B 43	Sets form length in number of line feeds.	6.22
ESC C NUL	27 67 00	1B 43 00	Sets form length in inches.	6.22
ESC D	27 68	1B 44	Defines a horizontal tabulation program.	6.20
ESC E	27 69	1B 45	Sets emphasized printing mode.	6.15
ESC F	27 70	1B 46	Clears emphasized printing mode.	6.15
ESC G	27 71	1B 47	Sets Double Strike printing mode.	6.13
ESC H	27 72	1B 48	Clears Double Strike printing mode. Enables Draft mode.	6.13
ESC I	27 73	1B 49	Expands printable characters.	6.24
ESC J	27 74	1B 4A	Prints characters stored in print buffer and executes an n/216 in line feed.	6.19

ESC K	27 75	1B 4B	Sets normal graphic printing mode.	6.28
ESC L	27 76	1B 4C	Selects double density and halved speed printing mode.	6.29
ESC M	27 77	1B 4D	Selects Elite printing mode (12 char/in).	6.15
ESC N	27 78	1B 4E	Defines BOF area in number of lines.	6.23
ESC O	27 79	1B 4F	Clears BOF area.	6.23
ESC P	27 80	1B 50	Clears Elite printing setting.	6.15
ESC Q	27 81	1B 51	Defines right hand margin position.	6.20
ESC R	27 82	1B 52	Selects national character set.	6.24
ESC S 0	27 83 48	1B 53 30	Sets printing of superscripts.	6.18
ESC S 1	27 83 49	1B 53 31	Sets printing of subscripts.	6.18
ESC T	27 84	1B 54	Clears printing of superscripts and subscripts.	6.18
ESC U 0	27 85 48	1B 55 30	Sets bidirectional printing.	6.26
ESC U 1	27 85 49	1B 55 31	Sets monodirectional printing.	6.26
ESC W 0	27 87 48	1B 57 30	Clears enlarged printing mode.	6.14
ESC W 1	27 87 49	1B 57 31	Sets enlarged (double-width) printing mode.	6.14
ESC Y	27 89	1B 59	Selects BIM with double resolution and normal printing speed.	6.29
ESC Z	27 90	1B 5A	Selects BIM with quadruple resolution.	6.29
ESC ^	27 94	1B 5E	Sets BIM with 9 dots in vertical format.	6.30
ESC b	27 98	1B 62	Defines a series of vertical tabulation programs (maximum 8).	6.21
ESC i 0	27 105 48	1B 69 30	Clears immediate character printing feature.	6.27

ESC i 1	27 105 49	1B 69 31	Commands immediate printing of character just received.	6.27
ESC j	27 106	1B 6A	Executes an n/216 in reverse line feed.	6.19
ESC l	27 108	1B 6C	Defines left hand margin position.	6.20
ESC p 0	27 112 48	1B 70 30	Clears proportional printing mode.	6.16
ESC p 1	27 112 49	1B 70 31	Sets proportional printing mode.	6.16
ESC s 0	27 115 48	1B 73 30	Clears half-speed printing.	6.27
ESC s 1	27 115 49	1B 73 31	Sets half-speed printing feature.	6.27
ESC t 0	27 116 48	1B 74 30	Selects first tray of automatic sheet feed (default value).	6.27
ESC t 1	27 116 49	1B 74 31	Selects second tray of automatic sheet feed.	6.27
ESC x 0	27 120 48	1B 79 30	Resets NLQ.	6.27
ESC x 1	27 120 49	1B 79 31	Sets NLQ.	6.27
DEL	127	7F	Clears last printable character from print buffer.	6.27